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VOL. 45 ISSUE 05

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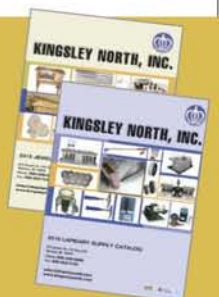
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Rock&Gem

Volume 45, Number 05

May 2015

ON THE COVER

Ladysmith, Wisconsin, is the site of a remarkable deposit of copper species. This Flambeau mine chalcocite specimen (3.4 cm high) has an attractive metallic-blue patina. (Jeff Scovil photo/Irv Brown collection)

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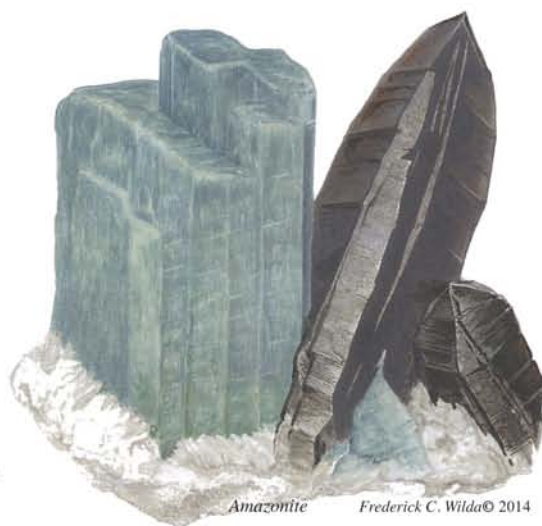
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FIELD NOTES

Lamp-idary

I create lamps from translucent minerals, crystals, gemstones, beach pebbles, and seashells. I would like to hear from others who are doing similar work.

—Kevin Vincent Kelly
Catskill, NY
freedomkvk@yahoo.com



FRAN PETERS PHOTO

Heartfelt Collecting

In one of the older issues, there was an article about heart-shaped rocks. There was a term used for heart-shaped rocks. I have forgotten that term and cannot find it in the magazines I have. Would you please give me that term?

—James Yarber
via e-mail

The term is "cordiform". The article, "Specimens with a Heart", by Fran Peters, appeared in our November 2007 issue.

—Editor

First Dig

I just finished reading my first issue of *Rock & Gem* magazine. Your magazine inspired me to go on my first dig. My dad and I went to the Diamond Hill mine in South Carolina and dug for skeletal quartz, amethyst, and smoky quartz. Even though we didn't find much, it was very fun and I want to thank you for inspiring me to go do something that the average teenager might not do.

I am finishing my first lapidary class and volunteer at the Middle Tennessee Museum of Natural History in Murfreesboro, Tennessee. They are currently working on erecting a *T. rex* skeleton and I am getting to help, along with other volunteers and the museum paleontologist.

I saw your article on fluorescent gems and minerals and I couldn't help but connect the dots ... the museum I volunteer at also has a display of fluorescent gems and minerals.

Thank you for the interesting articles. I look forward to reading the next issue.

—Logan Balsley
via e-mail

Water Problem

I just read the Eco-Friendly Jeweler article "Reducing Toxicity in the Workshop, Part I", by Christine Dhein (March 2015). In the article, Christine says, "The paste [flux] will dry out between uses. Add water to thin or reconstitute the paste" (p. 32).

I have heard that, when adding water to any product (flux, anti-firescale, etc.), it is most important to use *distilled* water to avoid contamination by any possible additives in "tap" water that may discolor or otherwise cause negative results with the final outcome of using that product. Is this true? If so, I think it would be a valuable correction. No one, especially a student that is on the other (steep) side of the learning curve, wants to have unnecessary trouble in their journey toward beautiful art, and this is an easy fix.

—Gabriele Dunn
via e-mail

To make paste flux from a borax cone or refresh any type of paste flux, tap water is commonly used, but if your water is particularly hard or laden with chemicals, consider using bottled drinking water or distilled water. I always use tap water and have never had a problem.

—Christine Dhein
Rock & Gem contributor

Send your comments to editor@rockngem.com or mail to Field Notes, *Rock & Gem* magazine, 5235 Mission Oaks Blvd. #201, Camarillo, CA 93012. All submissions are subject to editing for content and length.

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LAPIDARY OF THE MONTH

My father spent many years as a cement finisher working road construction on Interstate 29 in South Dakota. He would collect rocks during his lunch and coffee breaks. To find the “good” ones, he would spit on them to see how pretty they were. A few always passed the test and came home with him at the end of the day. When I was growing up, we continuously had a polishing machine running loudly in the background.

The lower stone on this pendant is one he collected and polished. The fossil and gray moonstones were purchased at a local rock shop.

To make the pendant, I carved a design into cuttlebone to create a mold. I melted sterling silver scrap and poured it into the mold to create a sheet of textured silver. Cuttlebone can be picked up on ocean beaches or purchased at most pet stores. This casting process is a simple, low-tech method that can be completed from start to finish in about an hour. There are numerous ways to create a mold for casting.

Once the casting was complete, I drew a design on paper to create a pattern for the sterling silver pieces. I applied rubber cement to a sheet of 18 gauge sterling sheet metal, the cuttlebone cast sterling sheet, and the paper pattern. When the glue was dry, I attached the paper pattern to the metal, then cut each sterling piece out along the edge of the pattern with a jeweler’s saw.

Next, I wrapped fine silver bezel wire around each stone, clipped the wire at the proper point, and soldered all the seams. After the bezels were prepared, they were soldered to the pieces cut from the silver sheet metal. I formed a bail and soldered it to the back of the piece, then used half round and flat metal files to smooth the rough cast metal surfaces and remove saw marks from the sterling edges.

The pieces were cleaned and then all stones were set using traditional setting tools. I drilled a small hole in both the lower section of sheet silver and the lower cast attachment. I added a 16 gauge sterling jump ring to connect the two finished sections.

A liver of sulfur patina was applied. The pendant was then given a thorough cleaning with liquid soap and water and allowed to dry. Finally, some of the patina was buffed away with a polishing cloth to create shiny silver highlights and showcase the stones in the best possible way.

My father was a very special guy and I always wear the necklace on his birthday. The energy of the fossil blended with the energy of this rock truly helps bring me to a place of peace and remind me of him and his love for rocks.

—Karen J. Lauseng
Silver City, NM



Would you like to be named Lapidary of the Month?

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- Write a 500-word step-by-step description of how you crafted your lapidary project from start to finish. Save it as a document file.
- Take at least one sharp, close-up, color digital photo of the finished project. Photos must be high-resolution (300 dpi at 4 inches by 5 inches, minimum).
- Attach your document file and digital photo (.tif or .jpg) to an e-mail and send it to editor@rockngem.com with the subject line “Lapidary of the Month”.
- Make sure you include your name and street address (not a PO Box)



for prize delivery should your entry be selected for publication. Only winners will be notified. E-mail the editor or call (972) 448-4626 with any questions about these requirements.

Lapidary of the Month winners receive a two-speed Dremel Model 200 N/40 MultiPro kit and a wall plaque in recognition of their creativity and craftsmanship. Winning projects are also posted on our Web site, www.rockngem.com.

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1-3—KALAMAZOO, MICHIGAN:

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1-3—RICHMOND, VIRGINIA: Retail show; Treasures of the Earth, Inc., Richmond Raceway Complex; 600 E Laburnum Ave; Fri. 12 noon-6 pm, Sat. 10 am-5 pm, Sun. 10 am-4 pm; Adults \$5.00, military free with ID, Children 16 and under free; Vendors from across the US bring their merchandise to you. You will find • 14K and sterling silver, classic, estate, fashion and handmade jewelry • Loose stones, beads and findings, pearls • Mineral specimens, crystals, lapidary supplies • Books, carvings and gift items Displays and demonstrations by the Richmond Gem &

Mineral Society; contact Jane Westbrook, PO Box 59, GloucesterPoint, VA 23062, (804) 285-4281; e-mail: jane@treasuresoftheearth.com; Web site: www.treasuresoftheearth.com

2-2—WATERLOO, ONTARIO, CANADA: Annual show; Kitchener Waterloo Gem and Mineral Club, Waterloo Community Arts Centre; 25 Regina Street South, Canada; Sat. 10:00 am-4:00 pm; Admission is Free!; You will find rocks, minerals, fossils, meteorites, displays, beads and jewelry. Lots of Vendors. Children's activities include gem dig, uncover a fossil fish and free samples (for children only). ; contact Donna Hollander, 98 Julia Crescent, Kitchener, ON, Canada N2E 3M7, (519) 571-1418; e-mail: dhollander@rogers.com

2-3—ROSEBURG, OREGON: 45th Annual Show; Umpqua Gem & Mineral Club, Douglas County Fairgrounds; I-5 Exit 123; Sat. 9-5, Sun. 10-4; free admission; dealers, demonstrators, silent auction, raffles, door prizes, kids' activities; contact Sue Woodman, (541) 391-3347; e-mail: suew1952.sw@gmail.com

2-3—BILLINGS, MONTANA: Annual show; Billings Gem and Mineral Club, Al Bedoo Shrine Auditorium; 1125 Broadwater Avenue; Sat. 10 am-5 pm, Sun. 10 am-4 pm; Adults \$3, Children under 12 free; One dollar off coupon in the Billings Gazette; contact Doug True, (406) 670 0506; e-mail: dtruefossils12@yahoo.com

2-3—BOULDER CITY, NEVADA: Annual show; Southern Nevada Gem & Mineral Society, Boulder City; Bicentennial Park; Sat. 9:00 am-6:00 pm, Sun. 9:00 am-5:00 pm; Admission is Free!; contact Sheri Johnson, NV, (702) 525-0256; e-mail: blossom89121@yahoo.com

2-3—MARSHFIELD, WISCONSIN: Annual show; Heart of Wisconsin Gem & Mineral Society, Marshfield High School Fieldhouse; 1401 E Becker Rd.; Sat. 10:00 am-5:00pm, Sun. 10:00 am-4:00 pm; Admission is FREE; 42nd annual Gem, Mineral Fossil & Jewelry Show. Displays, dealers, kid's activities, continuous silent auctions, speakers, free admission, donations accepted.; contact Cynthia Kelman, 1403 N Broadway Ave, Marshfield, WI 54449, (715) 387-8782; e-mail: kelman@tznet.com

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The Other COPPER MINERALS

PART I: Lesser-Known Collectible Species

Story by Bob Jones

Every collector enjoys a cluster of common copper species, particularly bright-blue azurite and luscious green malachite. Yet, dealers and most collections have a limited number of the lesser-known and less popular copper species as a part of a copper suite. Some of them are colorful, but many are gray to black. Still, they can be fascinating to collect.

These uncommon copper species may be limited in availability or relatively unattractive, yet are certainly important as collector species. Some are not important moneymakers for dealers, which may account for their limited availability. Dealers need to get a generous and steady return from their sales, so they tend to stock the more popular species. Yet, there are copper species that are worthy of study and certainly deserve the attention of dealers and collectors, including aurichalcite, bournonite, bornite, covellite, enargite, chalcocite, linarite, olivenite, caledonite, plancheite and boleite.

Chalcocite, covellite, bornite and enargite are all ores of copper and are found in massive form, but each has also been found in nicely crystallized specimens that are eminently collectible. They lack bright color, though some can show a nice metallic-blue patina. These copper sulfides are mined primarily for their copper content, which tends to limit their survival as nicely crystallized specimens.

This two-part article is devoted to raising awareness of some of the more obscure copper species every collector should take to heart.

BOLEITE

Boleite is a good example of a copper species you very seldom see for sale, let alone have a chance to buy. This very complex copper, lead, silver, chloride is found only as very small, often microscopic, cubic crystals in a very limited number of localities. The finest boleite came from the Santa Rosalia mine in Baja California Sur, Mexico. It occurred in small crystals, under an inch on an edge. This source was briefly mined for specimens some decades ago, but has long since dried up. The Mammoth St. An-



HERITAGE AUCTIONS PHOTO

Virtually all the chalcocites from the short-lived Flambeau Copper property showed large, complex, hexagonal crystals and a gold and purple iridescence. (Ladysmith, Wisconsin)

thony mine at Tiger, Arizona, produced a small number of boleite crystals before it closed in the 1950s. Only a few other, inconsequential occurrences have produced boleite, so it is truly a rare species. It is also very attractive, as it forms in perfect cubes that are a rich blue to blue-black. Only when an old collection is dispersed or discovered by accident, however, may a boleite specimen surface for sale.

Some years ago, my son Evan and I were at the September mineral shows in Denver. While looking through a dealer's stock, Evan found a small, quite lovely specimen labeled "azurite". He immediately called me over to check the specimen, and we bought it for \$25. Evan recognized that the dealer had made a mistake. The "azurite" turned out to be a specimen of boleite—a lucky find, thanks to a practiced eye!

AURICHALCITE

As opposed to boleite, the blue mineral aurichalcite is quite common. It is found in a number of localities, but never in clusters of large crystals. It most often occurs as clusters of radiating needle crystals with a delicate blue color. The mineral is a zinc, copper, hydroxyl carbonate, so it can be found anywhere that is noted for secondary species of these metals. Mapimi (Durango), Mexico, has produced fine, velvety specimens on brown limonite matrix. Showy specimens that are up to several inches across were commonly found at Mapimi during specimen mining operations in the 1950s. The quantity was great enough that specimens continued to come to light for the next several decades.

The 79 mine, near Hayden, Arizona, has probably yielded the finest examples of this mineral. Lovely spherulitic tufts of bright-blue needles are seen in many local col-



A stellate mass of stout, black prisms with flat terminations shows faint iridescence. Colorless, bladed barite is in the center of the specimen. (Julcani mine, Peru)

HERITAGE AUCTIONS PHOTO



Rich-blue, fibrous aurichalcite has invaded intergrown, lustrous, calcite rhombs measuring up to 1.25 cm across. (Ojuela mine, Mapimi, Mexico)

ROB LAVINSKY PHOTO/WIKIMEDIA COMMONS



This treelike cluster of 3-dimensional, thick bornites is exceptional for its overall aesthetics. (Redruth, Cornwall)

ROB LAVINSKY PHOTO/WIKIMEDIA COMMONS



Some spectacular crystallized covellite specimens came out of the Butte mining district of Montana. (Leonard mine, Silver Bow County)

lections thanks to very active amateur collectors who worked the long-closed mine. One area in the mine became known as the "Aurichalcite Room", indicating the fair quantity of specimens available there. Bisbee, Arizona, has also yielded plenty of aurichalcite specimens.

The type locality for aurichalcite is the Loktevskiy mine in the Altai Mountains of Russia, but I have yet to see a specimen from there, even though I've had the opportunity to see important collections in Moscow at the Vernadski Museum, the Fersmann Museum, and the University of Moscow.

The noted specimen producer in Namibia, the Tsumeb mine, yielded small amounts of aurichalcite from its upper oxide zone, which was mined in the early 1900s, but little has come from the lower oxide zone. More common are small aurichalcite specimens from recent mining operations in the Democratic Republic of Congo. As productive as the mines of China have become, a find of aurichalcite has yet to be reported.

CHALCOCITE AND BORNITE

Chalcocite, a copper sulfide, and bornite, a copper iron sulfide, very often occur together. The Cornish mines at Redruth,

Cambourne, St. Just, and other nearby sites produced wonderful crystallized chalcocite and bornite as far back as the 17th century. These mines have been closed for over a century, so specimens are uncommon to rare these days.

In the United States, the most important copper mine in the days just after the American Revolution was discovered in Bristol, Connecticut. My research tells me it was initially developed by a distant relative of my three children, on their mother's side. Bristol produced marvelous chalcocite and bornite specimens.

The bornite crystals were generally rounded and rather crude, which seems to be a habit of this copper iron sulfide. But the chalcocite crystals made up for them by occurring in fine clusters of striated, tabular blades that often exhibited choice twinning. Fortunately, during the halcyon days of Bristol production in the mid-1800s, three Yale professors owned the property, so many specimens survived.

When the copper deposits of the Butte mining district (Silver Bow County), Montana, were opened in the late 1800s, fine, large bornite crystal groups were found fairly commonly. The crystals were sometimes pitted and rounded, and often twinned.

They were usually associated with small quartz crystals. With the closure of the Butte mines, however, that supply dried up.

While bornite crystal groups are quite uncommon, it is a mineral many people own because it is regularly offered for sale in gift shops. Sold as "peacock ore", these pieces of massive bornite ore have developed a strong, colorful tarnish, not unlike the rainbow of colors seen in a peacock's tail feathers. Another odd characteristic of bornite is its unusual crystallization. When formed in low-temperature solutions, it develops orthorhombic crystals. At high temperatures, however, bornite crystallizes in the cubic system.

At Ladysmith, Wisconsin, in the 1990s, a remarkable deposit of copper species, primarily chalcocite and bornite, was finally mined after having been found through aerial survey years before. Open-pit mining exposed many pockets of chalcocite and bornite. Fortunately, the mine owners allowed collector Casey Jones to mine for specimens. While he is no relation to me, Casey lived in Arizona as a teenager, and he and I enjoyed searching for good minerals, including a lost cinnabar mine.

Casey dug wonderful quantities of fine chalcocite—many specimens showing fine



Tabular blades of Montana enargite show deep striations along their length. (Leonard mine, Silver Bow County)



This classic chalcocite shows the complex habit and striated faces that are characteristic of specimens from the Bristol mine. (Hartford County, Connecticut)

twinning—at Ladysmith. He recovered bornite of excellent form, often a lovely metallic blue, and superb chalcocites that often had a wonderful bronze patina. It was my good fortune to be invited to dig at Ladysmith by Casey when he was hitting nice pockets of copper sulfide specimens.

Bornite crystals have come from a number of older copper deposits like Bisbee, Arizona, but today specimens are more common from the African copper deposits of the recently closed Tsumeb mines and the still-operating mine at Mindouli, Zimbabwe, which is a source of superb crystals.

Chalcocite, like bornite, can occur in two different crystal forms—hexagonal and monoclinic—depending on the temperature of formation. It has been found as pseudomorphs after other copper minerals, like bornite, covellite and pyrite.

The list of sources for chalcocite is far greater than those for bornite, and it includes most classic copper localities. More recently, chalcocite has been found in fine crystal groups at the Telfer gold mine in Western Australia, at Tsumeb, in active mines at Zhegzazhan (Kazakhstan), and in the copper belt of Central Africa, particularly Kipshi, Katanga, which produced superb specimens.

ENARGITE

One of the major ores found in the Butte district is the copper arsenic sulfide enargite. It was found in quantity and in superb crystallized specimens. These 1-inch tabular blades showed deep striations along their length. With flat terminations and those obvious striations, enargite crystals are easily identified. Some of the



Two perfect cubes of boleite on clay matrix are a deep Prussian blue and have a vitreous luster. (Amelia mine, Boleo District, Baja California Sur, Mexico)

crystals were trillings, three crystals forming a complex twin cluster.

As attractive as Butte enargite is, the Montana crystals were far exceeded in size by specimens from Peru. The mines at Quirivilca and Cerro de Paso have produced stunning enargite specimens, with the latter locality yielding specimens holding crystals up to 8 inches long! Tsumeb was not far behind the Peruvian sources, as it

yielded fine specimens of crystals over 3 inches in length. Unfortunately, enargite crystals are not commonly found on the market today.

COVELLITE

The Butte district was also the source of some spectacular covellite crystal specimens. The mineral was actually a minor ore here, and it was sometimes found in fragile, thin-bladed, hexagonal crystals in lovely clusters. The color of many covellites is most attractive: a delightful indigo blue. Sometimes, crystals were found that were lightly coated with brassy chalcocite, which added to their beauty. Covellite blades from Butte can be as large 2 inches across. Most blades are paper-thin, but occasionally the blades approached ¼ inch thick.

Most of the covellite you may see available today comes from Summitville (Rio Grande County), Colorado. The simple copper sulfide is mined there in massive quantities, recovered from thick veins choked with tightly packed blades. The mode of occurrence here made fine specimens almost impossible to collect; though individual blades might measure several inches across, they are packed together so tightly as to make it impossible to extract specimens undamaged. Still, the lovely indigo color, large specimen size, and only slightly damaged condition of some crystals makes the Summitville specimens attractive enough to collect. ♦

Part II will feature some of the more colorful members of this group, including olivenite, plancheite, linarite and caledonite.

BENCH TIPS

Large Cabs: Sanding Steps



Dry sand the surface with a worn 60 grit silicon carbide belt, checking for flat spots between the first (left) and second passes.



Check for flat spots using the fluorescent light (left). These must be corrected via the wet 100 grit sanding step.

After grinding the surface to the preliminary dome shape, dry sand over the surface with a worn 60 grit silicon carbide belt. Because it is well worn, the surface of this belt should be very smooth and shiny, and therefore it won't leave easily noticed scratches. I keep these dry sanding belts separate from those that I use wet so as to maintain this smooth texture.

This dry sanding technique can only be used on larger surfaces, not on sharp angles or on the girdle, because heat will build up quickly and "burn" small white spots onto the surface being sanded. The advantage of doing most of the sanding with a dry belt is that it goes quickly and you can observe the progress without having to dry the cab each time you want view it.

The scratches are quickly eliminated and the high or low spots become readily evident. Hold the cab so that you can see the profile from each end and each side, as well as any remaining scratches from the preliminary sanding to determine whether the dome contours need correction before you proceed. If they do, either go back to the grinding step to do the correction or, if the correction needed isn't significant, wet sand

with a 100 grit sanding belt. When these corrections are done, return to sanding with the dry, worn 60 grit belt.

When sanding dry, a few precautions are necessary. In addition to wearing adequate respiratory protection, you must proceed slowly so as to prevent too much heat buildup. This is done by using a sweeping motion to pull the cab toward you, from the near side to the backside. Repeat this action once. Look for signs of scratches and feel for any heat buildup. If the heat gets to the point of feeling slightly uncomfortable, stop and cool the cab with your hands. As you pull the cab toward you, don't rock it beyond the top of the girdle line. Check it frequently and alter your motion if necessary. Continue this action all the way around the cab until all the dips, high points, and scratches are gone. The appearance at this point should be an overall smooth look, with only very small sanding lines visible.

The next step is dry sanding with a well-worn 220 grit belt. Use the same motion as in the previous step. It will further smooth the surface and will result in much finer sanding lines and a semipolished look. The surface should be so smooth that you can

see the reflection from light bulbs on it. This is where the double-bulb fluorescent light above your workbench comes into play.

Hold the cab with the long dimension parallel to the bulbs above you so that you can see the twin reflections on the surface. Slowly move the cab so that the reflections move across it. These reflections must stay parallel and straight. If they ripple, it indicates there are uneven surfaces that need to be sanded out. If they spread apart as they pass over the top of the dome, it indicates a flat top on the cab. This must be corrected by going back to the first (wet) 100 grit sanding step to remove material from each side of the flat spot. This may take some time and effort because of the amount of material that needs to be removed.

Next Month: Finishing the girdle, final sanding, and polishing. 💎

Bob Rush has worked in lapidary since 1958 and metal work and jewelry since 1972. He teaches at clubs and at Camp Paradise. Contact him at rocksbob@sbcglobal.net.





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Most of the plant fossils found in Ghughua Fossil National Park are petrified fossils. Palm trees make up the majority.

Ghughua Fossil National Park

See and Touch These Cretaceous Plants

Story and Photos by Khursheed Dinshaw

To see fossil plants on display in museums is a privilege. To see and touch fossil plants that exist in their natural surroundings is a blessing. The Ghughua Fossil National Park in the Dindori district of Madhya Pradesh State, India, offers visitors both opportunities.

The Fossil Park is located 76 kilometers from the city of Jabalpur on National Highway 11. The park occupies an area of 27.34 hectares and covers two villages, namely Ghughua and Umaria (also known as Silthar). It is India's first fossil park in which tree fossils have been found, collected and displayed, and the exhibits are made open to visitors. Rupees 150 lacs (\$240,192 U.S.) has been allocated for the development of this park.

The park contains plant fossils that are 65 million years old (Cretaceous Period). Some of them are woody plants, leaves, fruits and seeds. In abundance are dicotyledons and palm fossil woods. These fossils represent a period in the history of Earth that is highly significant for the vegetational history of India, as a majority of plants attained their modern forms during this period.

Dr. Dharmendra Prasad, the Statistical Officer of the Mandla district and the honorary secretary of the District Archaeology Union, has been credited with discovering these fossils in 1970. In-depth studies were conducted on the fossils by S.R. Ingle, from Science College, Jabalpur, and Dr. M.B. Bande, from the Birbal Sahni Institute of Paleobotany, to identify and chronicle them.

In 1982—after the verification and authentication of the fossils, and in recognition of their importance—the Government of Madhya Pradesh took steps to confer the status of National Park upon the site. A committee led by former forest officer Ranjeet Singh proclaimed this area Ghughua Fossil National Park on May 5, 1983.



Leaf impression fossils represent a period in the history of Earth that is highly significant for the vegetational history of India.

Most of the fossils found in Ghughua are petrified fossils. In these fossils, the organic material has been replaced by minerals from the surrounding sediments or water. The degree to which the remains have decayed when they were covered determines the amount of detail in the fossil. Petrified fossils are also called “permineralized” fossils. The residents around Ghughua refer to these fossils as *patthar ke ped* in Hindi. The literal translation is “trees of stone”, which is scientifically quite correct.

The second variety of fossils found here are impression fossils. If the burial of material or accumulation of sediment is slow, bacteria and fungi may attack the organic material, and free oxygen may oxidize and consume it. In such cases, only an impression of the organism is left on the sediment’s surface. Third are compression fossils, such as those of fossil ferns, are the result of the chemical

reduction of the complex organic molecules composing the organism’s tissues. In this case, the fossil consists of original material, albeit in a geochemically altered state.

The fossil record of Ghughua consists mainly of plants belonging to the topmost Cretaceous to early Tertiary periods, dating back to 65 million years. So far, 31 genera belonging to 18 families have been recognized. In addition to palm trees, fossils of eucalyptus, mango and coconut trees have been found. Other fossilized plants include banana, jackfruit, black plum (known as Jamun in India), Utrasum Bead Tree (Rudrakash), and Aonla (Indian gooseberry). Most of these plants require moisture for their growth. Their presence is a clear indication that, in distant time, Ghughua was more humid and received much more rainfall than it does in present time.



This seed fossil is from one of the 31 palm tree genera, belonging to 18 families, that have been recognized.



The equatorial position of the supercontinent Gondwana supported a tropical environment in which shell-bearing animals thrived.



Root fossils from the numerous palm trees that once inhabited Ghughua indicate that a moist, tropical climate once prevailed.

Fossilized trees that are found near salty water are also in ample supply in the park. Presently, in the mountain range known as the Western Ghats and in the evergreen forests of the northeast of India, there are living members of the genera *Hyphaene*, *Polyalthia*, *Homalium*, *Hydnocarpus*, *Ailanthus* and *Barringtonia*. Only their fossils have been discovered at Ghughua. Fossils of some shell-bearing animals have also been found here, which led to the conclusion that there must have been a large body of water in the area at one time. No such water body exists today.

The genus *Ailanthus* includes about five species of trees and shrubs that are distributed in southern Asia, China and Australia. These are fast-growing deciduous trees that attain 25 meters to 45 meters in height and have spreading branches and large, pinnate leaves with long, pointed leaflets. Four species occur in India. Of these, the wood of two species, *Ailanthus malabarica* and *Ailanthus Grandis*, have been found to resemble the fossil wood. *A. Malabarica* is presently found in the Western Ghats, from Kanara southwards to Travencore, whereas *A. Grandis* is found throughout Assam and north Bengal.

Callistemon is a genus of about 30 species of trees and shrubs that are found in Australia. A few of these species are cultivated in India as ornamental plants. Plants of this genus are commonly called "bottle-brush", as the flower-bearing portions of



In this fossil, only an impression of the organic material was left on the sediment's surface.

the branches resemble bottlebrushes in shape. *Callistemon* fossils have been found in Ghughua.

Tristania conferta is a species of tall evergreen trees or shrubs that attain a height of about 45 meters. The genus was discovered at the Fossil Park, though its members can be found from the Indo-Malaysian

region to Australia and New Caledonia. *Canarium* is a large genus of about 100 species of medium-size to large tropical trees that are widely distributed throughout Africa, Madagascar, Mauritius, south Asia, and the Philippines. These evergreen trees grow up to 50 meters tall and have alternate pinnate leaves. About seven species



▲ Some *Eucalyptus*, a large genus of evergreen trees that it has its origin from Gondwana, grew to enormous sizes.

► Fossils of shell-bearing animals show that there must have been a large body of water in the area at one time.

have been known to occur in India, mostly in the tropical evergreen forests of Assam, Kerala and Andaman islands.

Pteridophytes and gymnosperms, which have seeds that are not enclosed, were abundantly found on Earth until the last stages of the Lower Cretaceous Era, when they began to gradually fade away. Flowering plants replaced them. Because of this, the ancient era to which these fossils belonged is of particular importance to us, for that was the time of origin of all modern-day forests.

Until about 120 million years ago, Ghughua was close to the equator and near a sea. A small branch of the Arabian Sea known as the Tethys extended up to the current Narmada Valley. It was also part of a very large landmass made up of the present-day Indian peninsula, Africa, Madagascar, Australia and Antarctica. This landmass was called Gondwanaland. There were no Western Ghats along the Indian peninsula's western coast in those days.

At that time, the climate of Ghughua had very little variation in temperature and probably received an annual rainfall of about 2,000 mm. Today's annual rainfall is 1,400 mm. The vegetation reflected this climate. There were dense equatorial forests of moisture-loving vegetation. Dominant among them were palms like *Chrysalidocarpus*, *Licuala* and *Arenga*. Low trees and shrubs like *Garcinia*, *Gomphandra*, *Grewia*, *Heynea*, *Atalantia*, *Limonia*, *Tristania* and *Polyalthia* also grew, along with moderate-to large-size trees like *Artocarpus*, *Canarium*, *Lophopetalum* and *Sterculia*.

Cretaceous Ghughua had a very long rainy season. The existence of such a climate was primarily due to three factors: the equatorial position of peninsular India at that time, the presence of a small branch

of the sea in the near vicinity, and the absence of the Western Ghats as a barrier in the path of the southwest monsoon. With no mountain range to stop the moisture-laden monsoon winds from reaching it, Ghughua endured their full impact.

The abundance of fossils at Ghughua tells us that dense forests existed here, as well as in nearby areas. Some ancient catastrophe, like a massive volcanic eruption, suddenly engulfed and killed these plants. The fossils give us vital clues about the geography and climate of this place in ancient times. They also tell us that India was once contiguous with Australia and Africa, as some of the fossil plants found in Ghughua



Palms dominate the fossilized vegetation of Ghughua National Fossil Park.

represent plant forms that are today native to Australia and Africa.

One example is the fossils of *Eucalyptus*, a large genus of evergreen trees that consists of more than 500 species. Currently, it is primarily confined to Australia, although one species occurs from New Guinea to the Philippines.

Some of the *Eucalyptus* are gigantic in size and are amongst the tallest and fastest-growing trees in the world. All *Eucalyptus* have oil glands in their leaves. In the extant flora of Australia, *Eucalyptus* is sandwiched between two extreme habitats: some are confined to dry, arid zones, and others to rainforests, according to their climatic environment. The fossil species probably represent a moist-climate species.

An interesting aspect of the Ghughua fossils is that, although these plants became extinct millions of years ago, they bear close resemblance to some current-day plants that grow in India, in the Western Ghats and in the northeast, including Sikkim. The living relatives of the fossilized *Hyphaenocarpus indicum* and *Palmoxylon ghuguensis* palms are *Hyphaene indica* and *Chrysalidocarpus lutescens*, respectively.

Sterculioxylon shahpurensis, a genus of the Sterculiaceae family, has its living relative in *Sterculia guttata*. The Myrtaceae-family fossils of *Syzygioxylon mandlaensis* and *Eucalyptus dharmendrar* have their living relatives in *Syzygium cumini* and *Eucalyptus*, respectively. *Elaeocarpoxyton mandlaensis*, which comes under the family Elaeocarpaceae, has its living relative in *Echinocarpus signatus*.

The fact that fossilized specimens of plants that are native to and alive in Australia, Africa and Madagascar have also been found further supports the theory of continental drift.

In addition to demonstrating that India, Africa and Australia once comprised a single mass of land, the study of fossils helps scientists determine the age of rocks. Earth's age is approximately 4.6 billion years. If we condense the planet's entire history into a 24-hour period, the relative amount of time for which these fossil plants lived comes to roughly 23 minutes, 40 seconds. Humankind appeared on Earth only one minute ago, at 23 hours and 59 minutes.

Can one imagine how old the Ghughua fossils are since they date back to 65 million years? The earliest forms of human beings began to appear only about 2 million years ago. The earliest signs of human civilization are only 10,000 years old. That means that the fossils at Ghughua are 325 times as old as the human race. When these fossils were being formed, the Himalayas were not in existence.

The Ghughua Fossil Park is divided into a fossil trail and a museum. The fossil trail is basically a walkway where visitors get to see and touch the fossils where they were found. In some places where numerous fossils were discovered, they have been put together on circular platforms along the walkway. Some of the tree fossils are still protruding from the earth, surrounded by grass. These are mostly fossils of palm trees. Palms belong to the monocot order Arecales and family Arecaceae. Most palms are distinguished by their large, compound, evergreen leaves, arranged at the top of unbranched stems.

The vast majority of palm species thrive in the tropics, and their diversity is highest in wet, lowland, tropical forests. The occurrence of the large number of fossil palms in the Ghughua area is also indicative of the moist, tropical conditions that once prevailed there.

Inside the museum, the fossils are placed on glass shelves. The main attraction of the museum is the fossil of a Eucalyptus tree that was discovered in Ghughua and is one of the few old fossils of its type found in India. Scientific investigations have revealed that it has its origin in Gondwana.

Another attraction is the fossil of a dinosaur egg, which is on display in a glass showcase. The fossils at the museum have been installed by the Centre for Environment Education (CEE), located at Ahmedabad, in consultation with the Birbal Sahni Institute of Paleobotany, located at Lucknow.

For further information on the Fossil Park, visit <http://www.madhyapradesh-tourism.com/wildlife/national-parks/ghughua-fossil-park.html>.



◀ This fossilized trunk of a coconut tree, a tropical plant, is 65 million years old.

▼ This palm leaf fossil dates from the topmost Cretaceous to early Tertiary period.



► Much fossilized wood remains in the ground and can be viewed from the fossil trail.

2-3—LUBBOCK, TEXAS: Annual show; Lubbock Gem and Mineral Society, Lubbock Memorial Civic Center; 1501 Mac Davis Lane; Sat. 10:00 am-6:00 pm, Sun. 10:00 am-5:00 pm; Adults \$4.00, Seniors \$3.00, Students \$2.00, Children Under 6 Free; 57th Annual Gem, Mineral, Fossil, Bead and Jewelry Show and Sale; Dealers, Demonstrators, Exhibits, Silent Auction, Hourly Door Prizes, Fluorescent Mineral Display, Kid's Games, Grab Bags, Classic & Contemporary Handmade Jewelry, loose Stones, Rough, Cabs, Slabs, Geodes, Beads, Minerals, Jewelers, Wire Wrappers, lapidary demonstrations, Adult Grand Prize, Junior Grand Prize.; contact Walter Beneze, (806) 797-5832; e-mail: walt@lubbockgemandmineral.org; Web site: www.lubbockgemandmineral.org

2-3—WACO, TEXAS: Annual show; Waco Gem and Mineral Club, Extraco Events Center; 4601 Bosque Blvd.; Sat. 9:00 am-6:00 pm, Sun. 11:00 am-5:00 pm; Adults \$5, Students \$1, Children \$1; contact Andrew McDonald, Stephanie Robert, 3039 Spring Valley Rd., Lorena, TX 76655, (254) 366-3846; e-mail: babydocmac@aol.com; Web site: www.facebook.com/WacoGemAndMineralClub

2-3—EVERETT, WASHINGTON: 62nd Annual Gem, Jewelry, & Mineral Show; Everett Rock & Gem Club, Everett Community College; Student Fitness Center, 2206 Tower Street; Sat. 10 am-6 pm, Sun. 10-5; Admission is Free; Dealers, demonstrations, door prizes, raffles, drawings, kids' activities, silent auction, exhibits and displays, food; contact Fritz Mack, PO Box 1615, Everett, WA 98206, (425) 232 0809

2-3—KALISPELL, MONTANA: Annual show; NW Montana Gold Prospectors Club, Fair grounds @ Kalispell, MT; Corner of: Meridian + W. Idaho; Sat. 9:00 am-5:00 pm, Sun. 10:00 am-4:00 pm; Adults \$2.00, Children under 12 free; The show features a raffle for a rifle, metal detector, gold nugget, silver bars, and more! We have a gold panning area for the kids and adults, as well as hourly door prize drawings. There will be expert instructions on all facets of gold prospecting, information on how to access some of the best gold areas in NW Montana, exhibits including gold, rocks as beautiful as gold, jewelry, metal detectors, gold prospecting equipment and supplies, gold mining machinery, and a whole bunch more! Contact Braxton Walburn (info. below), or Sandy. Sandy's phone = (406) 212-7415; contact Braxton Walburn, (406) 253-6200

2-3—PASO ROBLES, CALIFORNIA: Annual show; Santa Lucia Rockhounds, Paso Robles Event Center (Fairgrounds); 2198 Riverside Ave.; Sat. 10:00 am-5:00 pm, Sun. 10:00 am-5:00 pm; Adults \$3.00, active military free, Seniors \$3.00, Students Under

16 free, Children Under 16 free; Featuring petrified wood, displays, demonstrations, dealers, speakers Richard Wade and James Mills, geode cracking, drawing with 2 gram gold nugget as first prize, children's activities, free petrified wood specimen to first 100 children through door each day; contact Mike Judy, 799 Oxen, Paso Robles, CA 93446, (805) 238-4469; e-mail: mrhaludy@gmail.com; Web site: slrockhounds.org

2 - 3 — T O P S F I E L D , MASSACHUSETTS: Annual show; North Shore Rock & Mineral Club, Tops field Fairgrounds, Fair Trade Building and Coolidge Hall; Topsfield Fairgrounds, Rte. 1; Sat. 9 am-5 pm, Sun. 10 am-4 pm; Adults \$6.00, Seniors \$4.00, Students under 12 free, Children under 12 free; Exhibits, Hourly door prizes, mineral & fossil identification, gold panning, mineral sifting, geode cracking. Wholesale and retail dealers selling minerals, fossils, beads, lapidary, jewelry, gem stones, beads. Something for everyone!; contact Michele Weisberg, 29 Justin Street, Lexington, MA 02420, (781) 861-6653; e-mail: nsrmc@verizon.net; Web site: www.northshorerock.org

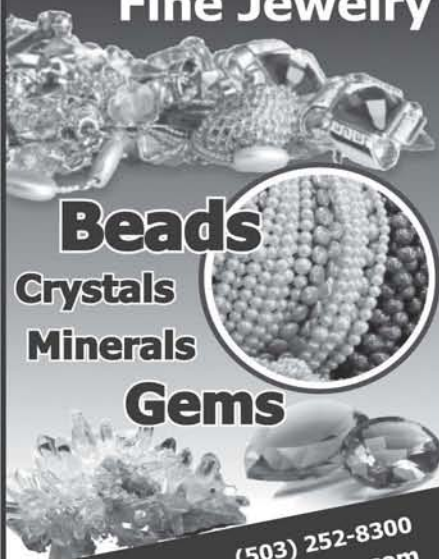
2-3—ANAHEIM, CALIFORNIA: Annual show; Searchers Gem & Mineral Club, Brookhurst Community Center; 2271 W. Crescent Ave.; Sat. 10:00 am-5:00 pm, Sun. 10:00 am-4:30 pm; Admission is FREE; Searchers' annual rock show with fun activities for kids! Free. See rocks, gems, minerals, fossils, beads, rough, slabs, vendors, gold panning, silent auction, hobby supplies, vintage stones, door prizes, gemstones, grab bags, tools, equipment and exhibits. Lapidary supplies. Demonstrations include stone carving, faceting, intarsia, wire wrapping and cabochon-making. Lunch, snacks and drinks are available.; contact Debra Tanner, 1148 E Sycamore Ave, Orange, CA 92866, (714) 329-0290; e-mail: Debra.Tanner@rockwellcollins.com; Web site: www.searchersrocks.org

2-3—YUCAIPA, CALIFORNIA: Show; Yucaipa Valley Gem and Mineral Society, Scherer Senior Center; 12202 First Street; Sat. 11:00 am-7:00 pm; Admission is Free!; Rock, mineral, and fossil specimens, tools, finished jewelry, demonstrations, silent auction and kids activities. Held in conjunction with the Yucaipa Music and Arts Festival, which includes many additional vendors, kids carnival, and live music entertainment.; contact Dennis Anderson, (951) 845-9195; e-mail: dennis.anderson@djanderson.net; Web site: www.yvgms.org

2-3—NORTH CHARLESTON, SOUTH CAROLINA: Show and sale; Lowcountry Gem and Mineral Society, Charleston Area Convention Center; 5001 Coliseum Drive, Exhibit Hall A; Sat. 10:00 am-5:00 pm, Sun. 10:00 am-5:00 pm; Admission is Free; A component of the North

continued on page 31

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MAY 29, 30, 31	TULSA, OK
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RG5/15



Reduce Toxicity in the Workshop

Health and Safety, Part 2

Dust masks can be worn for comfortable protection against nontoxic nuisance dusts.

OTTO FREI PHOTO



Do you use protection when you should? The two most common reasons jewelers give for not using safety equipment such as goggles and gloves is that the equipment is uncomfortable and gets in the way of work, for instance, by compromising vision or grip. Fortunately, the solution to these drawbacks is not complicated—just make sure your protective gear is comfortable and easy to use.

In addition to the guidelines here, many towns and cities offer free advice through government agencies. In the United States, the Department of Labor oversees the Office of Occupational Health and Safety (OSHA). Consult the Department of Labor Web site to find contact information for the regional office nearest you.

Eye Protection

Safety glasses, goggles, and face shields are designed to protect eyes from injury. Typical eye injuries occur when foreign matter, such as metal chips and dirt particles, strike the eye. Other hazards include chemicals, high-intensity light, tools and equipment. Eye protection is recommended when using power tools or chemicals and during soldering. However, jewelers may be exposed to small, flying metal chips at times when they might not expect, when forging, for instance, or even when sawing. When a saw blade breaks, a tiny piece of the blade could go flying, potentially striking the jeweler in the eye if they are not wearing eye protection.

A wide variety of safety equipment is available for eye protection. Depending on the type of work, you may be exposed to several hazards at the same time. Be sure to choose equipment that will protect you from the specific hazards present in your studio.

Safety Glasses: Ideally, safety glasses should wrap all the way

around to offer protection from the sides. Look for a product with quality lenses to ensure you are able to see well while working. When they are not in use, store them in a plastic bag or in a case on the bench to protect the lenses from being scratched by grit in the studio. To ensure comfort, choose a lightweight model with comfortable nose pads. Ideally, you should try the equipment on to test it for comfort before you make a purchase.

Soldering flames may emit ultraviolet light, so UV-coated eyewear is advised, especially when doing prolonged soldering. Lampworkers need to wear glasses with lenses that are appropriate for the materials they are working with.

High Intensity Light: Safety glasses for use with high-intensity light offer protection from infrared light, and should be used when using a kiln, casting, soldering platinum, or doing other work with high-intensity light. Various types of lenses offer different levels of protection. Be sure to use the lens type specified for the task.

Goggles: Safety goggles that create a seal against the face offer protection from chemical splashes and dust from the sides, the top, and the bottom.

Face Shields: Face shields are designed to protect the whole face, but should be supplemented with safety glasses.

Hand Protection

Gloves: Acid-resistant gloves are an important piece of personal protective equipment when working with chemicals. Check the Material Safety Data Sheet (MSDS) for the chemical you are using for a recommendation on which glove is appropriate. Use heat-resistant gloves from heat during heat-intensive processes such as casting and enameling.

Barrier Cream: Barrier cream is a topical formulation used to create a physical barrier between the skin and contaminants, which may irritate or infect the skin. Barrier cream should not be used in place of protective gloves. However, applying barrier cream before work can make cleaning the skin easier at the end of the day, such as when working with grease or oil. Barrier creams can also help protect against dust, hydrocarbon solvents, solvent- or oil-based adhesives, lacquers, lubricating compounds, polishing compounds, etc.

Lung Protection

Dust Masks and Respirators: Dust masks are disposable filtering facepieces. They can be worn for comfort against nontoxic nuisance dusts during activities like sweeping and dusting. These masks do not offer protection against hazardous dusts, gases or vapors. Dust masks are not approved by the National Institute for Occupational Safety and Health (NIOSH) of the U. S. Department of Health and Human Services.

Dust masks are often mistaken for single-use disposable respirators that are NIOSH approved, such as the N-95 respirators. A respirator is a device that protects you from inhaling dangerous substances, such as chemicals and infectious particles. Look for a NIOSH label or statement of certification, which should appear on the respirator or respirator packaging. It will tell you what the respirator is designed for and how much it will protect you.

In order to select the right respirator, perform an assessment of all the workplace operations, processes or environments that might create a respiratory hazard. The different types include particulate respirators and chemical cartridge respirators.

Safety experts recommend half-face respirators for the best protection. Purchase a quality respirator that includes disposable cartridges that can be changed depending on the chemicals being used and the size of the particles being generated. For polishing and grinding, for example, use the 3M #2097 cartridges. These cartridges are very lightweight, with a thin charcoal insert for nuisance smells. For protection against fluorides, chlorides, gases or ammonia, use a chemical respirator with 3M #60926 cartridges. Always mark your respirator with the date the cartridges were installed and replace them regularly, especially if you smell odors coming in through the mask.



OTTO FREI PHOTO

Face shields are designed to protect the whole face.

Ventilation

The information in this section has been adapted from *The Jewellery Workshop and Safety Report*, by Charles Lewton Brain, and is used with permission.

Ventilation removes dust and fumes or replaces air in any space to provide indoor-quality air that is safe to breathe. Prevention is the best ventilation system. As master goldsmith Charles Lewton-Brain states, "If you can substitute a material or process that means you get similar results without generating dangerous dusts or fumes, then you should consider switching." Processes that require ventilation include etching, chemical use, any processes that make dusts (polishing) or mists (spraying), or create fumes (soldering.)

The best ventilation systems are localized and use suction to remove the hazardous materials from the site at which they are generated.

fumes that need to be vented. The closer you are to a hood opening, the more effective it is. In general, fumes and dusts being generated should be as close as 6 to 7 inches to the mouth of a local suction system. To ensure the highest level of protection, ventilated processes should be totally enclosed. Make sure that vented air is removed completely and is not immediately sucked back into your building by a wrongly placed air makeup intake duct."

Localized ventilation systems can be made inexpensively from standard hardware, or industrial extraction units with filters can be purchased ready made. A fume hood is recommended if you use chemical solutions and processes.

A fume hood should be positioned near the back of the workshop so that exits are not blocked in the case of an accident. It should have enough aisle space in front of it that people working in the studio will not interfere with its use or the air movement into it by moving around or near it. Fume hoods should be tested every time you use them with a smoke trail or soap bubbles to be sure they are working effectively.

Ventilation removes air from your workspace. Therefore, it is important to ensure that your replacement air is not bringing in vehicle exhaust fumes, is not downwind from a chimney that is putting out toxic fumes, or otherwise bringing in noxious air.

Make sure you don't create negative pressure in a basement workshop by venting so much air out that it causes air to be sucked into the space through a water heater or furnace exhaust vent—this backflow can fill your workspace with poisonous carbon monoxide gas. ♦



RIO GRANDE PHOTO

The best ventilation systems use suction to remove the hazardous materials from the site at which they are generated.

Ventilation Questions to Ask Yourself

- Have you minimized all activities requiring ventilation?
- Can you substitute materials or processes to eliminate some ventilation needs?
- Is local (sucking from the work spot) ventilation adequate in your shop?
- Have you considered replacement air and where it is coming from?
- Has your ventilation system been approved and checked by a ventilation technician?
- Do you test and maintain your ventilation system regularly?



SURVIVAL OF THE MINERAL SHOW



The "Fine Mineral Show" is held in the very elegant Westward Look Resort, located just north of downtown Tucson.

The Importance of Promoted Events

Story and Photos by Bob Jones

Time was when mineral collectors could go into the field on a regular basis to collect pretty good specimens in some quantity. Self collecting was supplemented by dealers at local mineral shows, which were put on by clubs once a year. In the last few decades, however, collecting opportunities have dramatically diminished for several reasons: over collecting, sometimes by commercial interests; closure of federally administered land; and claim staking on productive sites are a few.



The Greater Denver Area Gem and Mineral Council promotes the annual Denver Gem and Mineral Show, which has attracted big crowds since 1967.



The East Coast Show, promoted by Zinn Expositions, is both retail and wholesale, and houses more than 150 dealers.

The halcyon days of mineral collecting are just about over. With few exceptions the halcyon days of club mineral shows are behind us, as well. The number of mineral shows has dropped, or they are being held for fewer days. Even finding a building in which to hold a show is a major problem in some areas. This has made it more difficult for dealers of minerals to find venues in which to sell their goods. Take into account the increasing number of new dealers who recognize selling minerals as way to make a living, and the need for organized shows is greater than before.

The two largest "club" shows enjoy some unusual advantages. The Denver Show is run by a coalition of clubs, while the Tucson Gem and Mineral Show® is organized by a strong local club with support from the city, the University of Arizona, organizations like Museum Curators Group and Friends of Mineralogy, and leading dealers and collectors. We still have the regional

federation shows, but even they have shrunk from four-day shows to three and sometimes two days.

Luckily, organized promoter shows have emerged as a major force in providing a stable and dependable venue for dealers, while providing collectors with a wide selection of fine minerals from all over the world. As important as the smaller club shows are, they simply cannot accomplish such a feat.

There is a small group of show promoters that is having a significant impact on the mineral market by establishing quality shows that are well advertised, run as businesses, and organized to bring together a broad spectrum of dealers mineral collectors can enjoy. Collectors now depend on promoted shows for the bulk of their mineral acquisitions.

In the 1960s and '70s, dealers who came to Tucson, Arizona, for the January-February show season were in a tough situation.

It was common to see them setting up their tables on street corners in Tucson because they could not get into the Main Show. The city began to take notice and made street selling very difficult, issuing citations and parking tickets in an effort to control things.

This gave some dealers the incentive to organize their own shows in a motel or other facility. Dealers were more than anxious to get in on anything organized. Unfortunately, some show promoters saw a chance to take advantage of dealers looking for a stable show site. This was really tough on the dealers, but they had little choice, so they participated.

Fortunately, those days are behind us. Today, the promoted shows are well run, carefully organized, well established, and stable. They give dealers, large and small, a chance to become an integral part of the mineral scene all over the country. Having been a buyer at and documenter of mineral shows nationwide, I have been able to



In the early days of the event, dealers who were unable to get into the organized shows in Tucson set up anywhere, forcing the city to take action.



The Zinn Exposition show in West Springfield, Massachusetts, features a private collection, like that of Jim and Gail Spann, in 50 display cases.



More than 40 promoted shows in Tucson, most held in tents, now offer dealers a good opportunity to do business in a controlled environment.



An important part of the Tucson Show is involving university students, who give visiting children a free mineral collection.

watch the evolution of promoted shows, and I've been pleased with what I've seen. Promoted shows have become the most important commercial venue of minerals in this country.

I know a lot about the several shows that are operated by Martin Zinn Expositions, since I have spent countless days participating in them as both a visitor and lecturer. These shows span the country and have been a stabilizing force in the hobby for over 30 years. I've spent time traveling with Marty in Europe and have had plenty of opportunities to talk about show philosophy with him.

Marty got into the business of promoting mineral shows by accident. He started collecting minerals as a kid and gradually expanded his collection, eventually becoming a collector/dealer. He really had no intention of becoming a show promoter, but he did recognize the problem dealers faced with promoters who were in the business purely for profit rather than to help dealers and the hobby.

In 1982, while visiting a show in Tucson, he was approached by a couple of dealers who had gotten into the show promotion game. Since Marty was moving to Denver,

they asked if he would be willing to partner with them to put on a Denver satellite show. He agreed, and over the next couple of years he got more and more involved in show promoting, recognizing the opportunity to implement some of his ideas of how a show should be managed and operated. He never looked back, and today, through his expert team under Zinn Expositions, he manages six shows across the country.

The Denver satellite show started in 1982 and was slow to take hold—it had only 12 dealers the first year—but became an important as a mineral venue as more and more international vendors joined the dealer group. The Denver satellite show was started with full knowledge of, and in support of, the Denver Gem and Mineral Show.

Around 1990, Zinn was asked to utilize his show promotion skills to open a new show in Springfield, Massachusetts. This request came from Ron Bentley (now deceased), a collector from Enfield, Connecticut, who wanted to capitalize on the absence of a large promoted gem and mineral show in the Northeast. Bentley and Zinn operated this show in the Springfield Convention Center for the first two years,

then moved the show to the Better Living Center at the Eastern States Exposition ("the Big E") in West Springfield. This location offered space for some 200 vendors in retail and wholesale sections and plenty of parking adjacent to the show building. (It should be noted as a youngster, before World War II, I had exhibited my show pigeons at the Exposition.)

The city of Tucson still holds all the records for satellite shows—usually around 40. The main mineral satellite show that emerged was the Desert Inn Show, promoted by the hotel owner; but in the late 1980s, ownership of that site changed. The new owner operated the show on a minimal budget, and the event slowly deteriorated. Dealers were subjected to some pretty difficult times when living in the hotel for several weeks in February.

When things got too bad, a dealer committee "drafted" Zinn Expositions to find a new location and set up a new satellite show. Marty located the Executive Inn, and in 1990, dealers were given an opportunity to move there from the Desert Inn. With the help of the hotel's general manager Bobbie Seaman, a delightful lady who worked closely with Marty to welcome dealers and



Before promoted shows became established in Tucson, the city government had to deal with a horde of unorganized street vendors.



The Tucson Show is prestigious enough to draw dignitaries like Tatiana Fabergé and Russian Ambassador Boris Yatskevich and secure a display of Fabergé eggs.



The Tucson Show's humble beginnings were in an elementary school in 1955. This photo from the show's 25th anniversary book.



Dealers unable to get into a show started the promoted show movement in Tucson.



The Holiday Inn is where the first satellite show in Tucson was held.



The well-established Tucson Gem and Mineral Show is prestigious enough to acquire outstanding exhibits, like this valuable gold-emerald necklace.

give them support seldom if ever seen at satellite shows, this became the hot new mineral satellite show.

Dealers enjoyed a comfortable show experience at the Executive Inn until the hotel changed hands in 2004. Shortly thereafter, dealers were forced to move to other hotel show locations. Eventually, this group of mineral dealers found a new home at the Inn Suites Hotel-Downtown Tucson.

Shortly after the start of the 1990 Executive Inn Show, the Quality Inn, about 300 yards to the north, became the satellite show location for fossils dealers. The general manager, Martha Musteen, was truly active in bringing fossil dealers to her hotel. The Quality Inn, later the Ramada Inn, provided a resort atmosphere, with a large courtyard, swimming pool, ballrooms, and lots of lawn area for displaying large fossils and mineral specimens. This property was converted to student housing around 2004.

In 1999, Zinn Expositions started a gem and mineral show in Southern California. The dates of the new Costa Mesa Show could have conflicted with the October Mineralogical Society of Southern California (MSSC) show, which had been held in Pasadena for many years, but Marty was very careful in scheduling it. The show moved from Costa Mesa to the Holiday Inn-Orange County Airport in nearby Santa Ana. The dates for the Santa Ana shows are set for mid-November and again in mid-May. With plenty of parking, great restaurants, and shopping opportunities nearby, this show proved successful.

In a recent chat with Marty, I wondered aloud when he was going to retire. The answer I got was encouraging, because he pointed out that he now has a very strong and dependable team handling his events. This speaks well for his staff, while suggesting to me that the Zinn Exposition shows are in good hands for the long term, which is reassuring to us collectors and to the dealers who depend on shows for their livelihood.

When I think of what it was like for mineral dealers some 50 years ago, I realize how important promoted shows are today. We now have stable shows that are held at the same time each year in the same place, and host the better dealers. With good business practices, excellent advertising, good signage, and well-run shows, today's show promoters have made it possible for dealers to make a living and for collectors to obtain the specimens they seek. The entire hobby is all the better for it!

In spite of his success in promoting and organizing shows, Marty still recommends that collectors and dealers support local shows. These small shows are the backbone of our hobby. They are run by volunteers who devote many hours to operating the shows. Profits from such shows are plowed back into the rockhounding community. Such shows bring in young people, are family oriented, and generate the most "new blood", which is so vital to our hobby! 💎

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ROCK SCIENCE

by Steve Voynick

The Many Origins of Fossils

One of the biggest attractions of collecting fossils is their remarkable diversity. Fossils, the remains or traces of prehistoric plants and animals, range from the 3.5 billion-year-old traces of microscopic cyanobacteria (blue-green algae) to the 10,000-year-old remains of huge Pleistocene mammoths. Fossil forms can include everything from silicified wood and bone to calcite shells, leaf impressions, inclusions in amber, and casts of tracks.

Exactly how plants and animals become fossilized depends on their biochemistries and the chemistries of their environments. Fossilization can occur in five different ways: petrification-replacement, carbonization, recrystallization, organic trapping, and molding-casting—and each produces distinctively different type of fossil.

Petrification-replacement, a common type of fossilization, produces large quantities of petrified wood and most fossilized bones. It occurs when mineral-rich solutions fill organic cells and crystallize (petrification) or fill spaces left by the removal of organic material and crystallize (replacement). The primary petrification-replacement material is silica; other materials include pyrite, calcite, the uranium mineral carnotite, and opal, the latter a hydrous, high-silica mineraloid that is the fossilizing agent in "opalized wood."

Carbonization occurs through physical and chemical alteration of plant and insect material. When the heat and pressure of deep burial drives off volatile hydrocarbon compounds in organic matter, it leaves behind a chemically stable carbon film in the shape of the original organism. Stems and leaves are often preserved this way, sometimes in such detail that the original cell structures are visible. These can be visually striking fossils, in which jet-black, carbonized plant or insect parts contrast sharply with a light-colored, rock matrix. In "coalification," massive plant remains become carbonized into coal. Coalification can preserve entire tree trunks by reducing them to elemental carbon that retains details of the original wood.

Recrystallization produces fossils via the chemical alteration of shell and sometimes bone material. Many shells consist of aragonite, a polymorphic form of calcite (calcium carbonate) that eventually breaks down. But aragonite sometimes converts, or recrystallizes, into more chemically stable calcite that can survive for millions of years



Petrified wood, which is preserved through silica-petrification, is one of the most widely collected fossils.

in fossil form. Although microscopic details of the original shell are lost, it retains its overall shape. Preserved shells over 200 million years old usually consist of calcite that has recrystallized from aragonite.

Organic-trapping is an unusual fossilization method that begins when organisms become trapped and preserved in tree sap, natural asphalt, or peat. Amber is fossilized tree sap that has been chemically altered through polymerization, which desiccates trapped organic matter such as leaves, insects and pollen, and preserves them in exquisite detail. Natural asphalt is also an organic-trapping fossilization medium. Animals trapped in surface tar pits, such as those at Rancho La Brea in Los Angeles, were fossilized because the encapsulating asphalt created an anaerobic, desiccating environment. In peat, a low-grade coal, high acidity prevents the normal decay of organic matter.

Molds and casts also preserve shapes or traces of life forms. Acidic solutions can dissolve an animal's shell or skeletal features, leaving behind the space they had occupied. This space functions as a mold when sediments fill it, then lithify into casts. The impressions of feet and tails left when animals walked through soft sediments were sometimes preserved as casts, too.

So fossilization is not just a single process, but a general term that refers to five different methods of preserving the remains or traces of ancient life forms. ♦

Steve Voynick is a science writer, mineral collector, former hardrock miner, and the author of books like *Colorado Rockhounding* and *New Mexico Rockhounding*.



Charleston Arts Festival. Hourly Door Prizes, Lapidary Demonstrations, Fossil Dig and Geode Cracking; contact Karen Havenstein, (843) 795-2956; e-mail: webmaster@lowcountrygemandmineralsociety.org; Web site: www.lowcountrygemandmineral.org

2-3—CINCINNATI, OHIO: Wholesale and retail show; Cincinnati Mineral Society, Sharonville Convention Center; 11355 Chester Road; Sat. 10:00 am-6:00 pm, Sun. 11:00 am-5:00 pm; Adults \$9.00, Children \$3.00; \$2 off admission coupon available at www.geofair.com; contact Bill Heimbrock, OH; e-mail: billheim@cinci.rr.com; Web site: www.geofair.com

2-3—BILLINGS, MONTANA: Annual show; Billings Gem & Mineral Club, Al Bedoo Shrine Auditorium; 1125 Broadwater Ave; Sat. 10 am-5 pm, Sun. 10 am-4 pm; Admission is \$3, Under 12 are Free; Silent auction, flint knapping demonstration, fossil preparation demonstration, raffle prizes, display exhibits, \$1 discount coupon in Billings Gazette newspaper; contact Doug True, Billings, MT, (406) 670-0506; e-mail: dtruefoliis12@yahoo.com; Web site: http://www.billingsgemclub.com/

6-10—FRANKLIN, NORTH CAROLINA: Annual show; Damian BellGali, Echo Valley Show Place (across from GLW); 6456 Sylva Rd. (across from GLW); Wed. 9 am-5 pm, Thu. 9 am-5 pm, Fri. 9 am-5 pm, Sat. 9 am-5 pm; Admission is Free; Wholesale and retail dealers from around the world selling minerals, fossil, gem, and rough rock; open to the public Sunday hours 9-4pm; contact Damian Bellgali, (678) 852-8273; e-mail: mandybelghali@yahoo.com

8-10—COSTA MESA, CALIFORNIA: Wholesale and retail show; Gem Faire Inc, OC Fair & Event Center; 88 Fair Dr.; Fri. Noon-6pm, Sat. 10am-6pm, Sun. 10am-5pm; Admission \$7, Children Free (ages 0-11); Fine jewelry, precious & semi-precious gemstones, millions of beads, crystals, gold & silver, pearls, minerals & much more at manufacturer's prices. Exhibitors from around the world. Jewelry repair & cleaning while you shop. Free hourly door prizes.; contact Yooy Nelson, (503) 252-8300; e-mail: info@gemfaire.com; Web site: http://www.gemfaire.com

8-10—FRANKLIN (28734), NORTH CAROLINA: Annual show; Gem & Mineral Society of Franklin, NC, Carpenter Community Bldg; 1288 Georgia Rd.; Fri. 10:00 am-5:00 pm, Sat. 10:00 am-5:00 pm, Sun. 10:00 am-4:00 pm; Admission is FREE; Rough and finished gemstone and jewelry along with local crafters. Club demos and raffle.; contact Norman Holbert, (828) 634-0350; e-mail: normholbert@comcast.net

8-10—COLUMBIA, MISSOURI: Annual show; Central Missouri Rock and Lapidary Club, Knights of Columbus Hall (New Venue); 2515 North Stadium Boulevard; Fri. 12:00

pm-7 pm, Sat. 9:00 am-5:00 pm, Sun. 10:00 am-4:00 pm; Adults \$5.00, Seniors \$3.00, Students \$3.00, Children Under 11 Free; Kidz Mine and Midwest Dealers, geodes, rough rock, cabochons, beads and beaded jewelry, wire wrapping, fossils, mineral specimens, crystals, agates, spheres, faceted gemstones, and handmade silver jewelry, door prize drawings.; contact Deb Booker, 6395 North Oakland Gravel Road, Columbia, MO 65202, (573) 356-5877; Web site: http://www.cmrlc.org

8-10—NORCROSS, GEORGIA: Annual show; Georgia Mineral Society, North Atlanta Trade Center; 1700 Jeurgens Court; Fri. 10 am-6 pm, Sat. 10 am-6 pm, Sun. Noon-5 PM; Admission is Free; Auction Saturday at 1 PM; lapidary demonstrations; door prizes; open house at our club house to celebrate our club's 80th birthday. ; contact Shelley Stubbs, (678) 612-7293; e-mail: mayshow@gamineral.org; Web site: www.gamineral.org

9-9—ARLINGTON, TEXAS: Annual swap meet; Arlington Gem and Mineral Club, Arlington Gem and Mineral Clubhouse; 1408 Gibbons Rd, behind the mosque; Sat. 8 am-1 pm+; Admission is Free; Annual outdoor swap meet with equipment, rock, slabs, cabs, faceting rough and stone, and things lapidary/met-alwork related. You never know what will be there. Bring your own tables/awning. Anyone is welcome to set up or come and buy or swap or just check out the club. Cost is free. Setup starts at 7 am. Potluck available at lunch in clubhouse. Call Jack Spinks at 469-515-6358 or email jlsplinks@sbcglobal.net for more info. Swap is located at 1408 Gibbons Rd, Arlington, TX---behind the mosque on the Rd to Six Flags. Look for the sign.; contact Jack Spinks, 209 Overlook Dr, Midlothian, TX 76065, (469) 515-6358; e-mail: jlsplinks@sbcglobal.net; Web site: agemclub.com

9 - 9 — BIG L E R V I L L E , PENNSYLVANIA: Swap and sale; Franklin County and Cen Penn Rock & Mineral Clubs, South Mountain Fairgrounds; 615 Narrows Road; Sat. 8:00 am-3:00 pm; Adults \$1.00, Seniors \$1.00, Students are Free, Children are Free; contact Tom Smith, (717) 532-7204; e-mail: tsmith1012@comcast.net

9-10—ESCONDIDO, CALIFORNIA: Annual show; Palomar Gem & Mineral Club, Center for the Arts, Escondido; 340 N. Escondido Blvd; Sat. 10:00 am-5:00 pm, Sun. 10:00 am-4:00 pm; Adults \$5, Seniors \$3; Gem Identification, lapidary and jewelry demonstrations as well as educational displays.; contact Gayle Hamilton; e-mail: gemshow@palomargem.org; Web site: www.palomargem.org

9-10—BOZEMAN, MONTANA: Annual show; Bozeman Gem & Mineral Club, Gallatin County Fair Grounds; 901 North Black, Building #1; Sat. 10 am-6 pm, Sun. 10 am-4 pm; Adults \$3.00 both days, Children

continued on page 57

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PROJECT:

“Old Ones” Inlaid Cuff



Dinosaur Bone Decorates This Southwestern-Style Bracelet

Story and Photos by Jeff Fulkerson

Years ago, I fell in love with fossilized dinosaur bone, and I’ve always been fascinated by petroglyphs. While trying to come up with a theme for the dino bone I wanted to use in a cuff, I came across some petroglyph pictures. It seemed like a marriage made in heaven. When I combined the two in a piece of jewelry, I wanted to give the piece a name. The Southwest tribes call the ancient inhabitants of Arizona, Utah, New Mexico, and other Southwestern states “the Ones Who Came Before”, or “the Old Ones”. This inspired me to call the cuff “The Old Ones”.

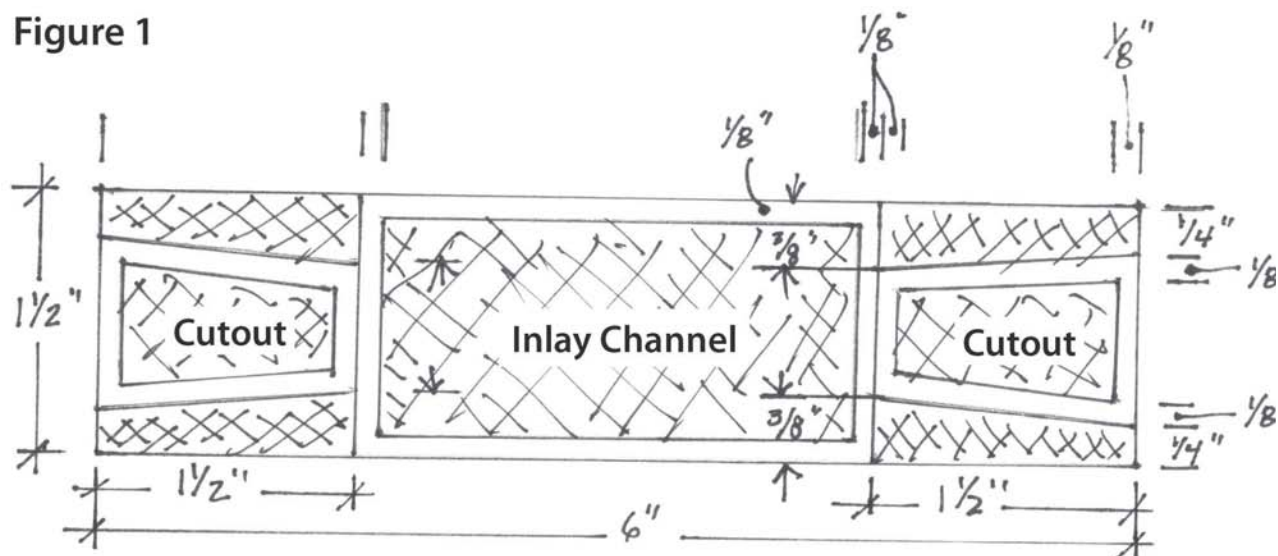


In this intermediate inlay project, I’ll show you how to make a simple channel to lay your stones into, and then show you how to do pillow inlay, rather than the traditional flush inlay. It gives the piece dimension, which makes it more dramatic to the eye. I used dino bone, but you can use whatever stones you like and mix and match them to suit your own tastes.

In flush inlay, where you polish all the stones at one time, you have to be very careful to choose stones that are very close in hardness. With pillow inlay, you polish each stone individually, so you can put a piece of opal right next to a piece of agate, and you won’t destroy the opal while you try to shape the agate.

You can use this same method to create an inlaid pendant, earrings or ring. What’s important is the technique. Once you are comfortable with the techniques, your only limitation is your imagination. So fire up your torch and your Genie and let’s get started!

Figure 1



SKETCH YOUR DESIGN

Trace the outline of the 1 1/2" X 6" piece of 14 gauge sterling silver sheet onto white paper.

Measure 1 1/2" in from each end and draw a vertical line to create a 1 1/2" square on each end and a 3"-wide rectangle in the center.

Measure and draw lines inside the rectangle to make a 1/8" border around your inlay channel. Shade the area inside the rectangle, which will be cut out.

On the outside edge of each square, make marks 1/4" from the top and bottom.

On the inside edge of each square, make marks 3/8" from the top and bottom.

Draw a line connecting each 1/4" mark with its corresponding 3/8" mark, then connect the pairs of 1/4" and 3/8" marks to create a side-lying trapezoid. Shade the areas on the outside of these lines.

Make marks 1/8" inside the first set and draw a second trapezoid. Shade the area to be cut out inside the 1/8" border.

INSTRUCTIONS

The first step is to sketch out your design for the top plate so you have a guideline to work from (see Figure 1). Play around with your design on paper. It's much easier to erase a pencil line if you don't like what you see than to cut into an expensive sheet of 14 gauge silver and discover you don't really like how it looks. I changed a few things in my design during the actual construction process.

Transfer your layout onto your 14 gauge silver using a rule and scribe. Make sure your silver is square before scribing the lines, because it may not come exactly square from your supplier.



1 Drill holes in the center cutout and the two end cutouts to start sawing along your lines.

TOOLS AND MATERIALS

1 1/2" X 6" 14 gauge sterling silver	Files
1 1/2" X 6" 18 gauge sterling silver	Bracelet mandrel
2" X 2" 14 gauge copper	Rawhide mallet
Miscellaneous stone slabs	Lapidary arbor
5-minute epoxy	Flat lap (optional)
Liver of Sulfur	Trim saw
Cotton swabs	Polishing machine (for silver)
Toothpicks	Miscellaneous stamps
Masking tape	Brass mallet
Acetone	Ruler
Jeweler's saw with #1 blades	Scribe
Bench pin	Soldering setup
Rolling mill (optional)	Permanent marker
	Flex-shaft
	Medium and fine silicon wheels

Start your piercing and sawing by drilling holes inside the channel scribe lines and the two end cutout lines. Saw around the ends, as well. Once everything is cut out, file every cut straight. This is especially important for the channel cutout, where you'll be inlaying your stones. Take extra care with your inside corners; they'll need to be clean to allow you to get a tight fit with the stones.

Use the 1½-inch X 6-inch 18 gauge sterling silver sheet to form a back plate. To give it a nice, rough texture that will show through the end cutout areas, run the piece through the rolling mill with 100 grit sandpaper. Flatten the piece out after you roll it. You may have to anneal it to get it flat again.

To accent the cuff in the end cutouts, I drew some “blanket” people, patterned after petroglyphs found in Mexico, on a sheet of 14 gauge copper and cut them out. Draw the figures on with a permanent marker, use your stamps to make patterns on them, and cut them out with the jeweler’s saw.

Before sweat soldering it to the back plate, you need to “tin” the top plate. Place the top plate on your soldering surface with the scribed side (bottom) up. Paint flux on the silver and flow medium solder onto it. Tin the petroglyphs, too, without using too much solder.

Tip: When you’re soldering copper to silver, you don’t want the silver solder to creep up onto the face of the copper. Before you tin your copper, on the backside of it, file a small bevel all the way around the underside, or bottom edge. This isn’t fool-proof, but it helps.

After you sweat solder the top plate and copper petroglyphs to the back plate, pickle the piece to remove any fire scale and rinse it in clean water. Use a brass brush on the copper to remove any leftover residue and make sure the piece is clean. Now you can cut away the part of the back plate that extends beyond the top plate and file all the edges. Round the sharp outside corners slightly so the cuff won’t injure anyone.

Using Liver of Sulfur or a similar product, blacken the recess on the ends around the petroglyphs at this time. Before forming, I like to pre-polish any hard-to-reach areas. On this piece, that means the back. Before you start any polishing, put tape over the petroglyphs so you don’t get any polishing compound in the recessed area or on the petroglyphs.

Shape the blank around a bracelet mandrel with a rawhide hammer. When you are happy with the shape, tape over the entire cuff, including the inside, except for the channel for the stones. This keeps excess epoxy from getting in places you don’t want it and makes cleanup much easier.



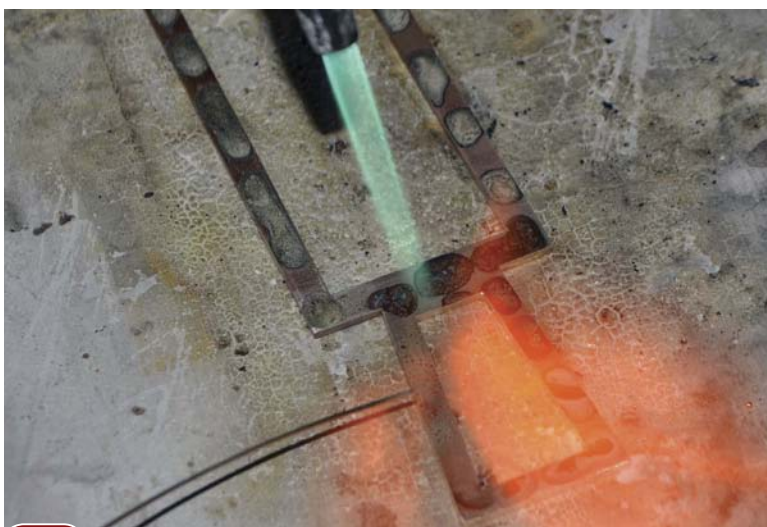
2

Roller print your 18 gauge back plate with 100 grit sandpaper to give it a nice rough texture.



3

After drawing and stamping your Blanket People, cut them out with a jeweler’s saw and undercut the backs with a file.



4

“Tin” the backs of the 14 gauge and the copper Blanket People using flux and medium silver solder.



5 After soldering the top plate to the back plate, cut away the outside of the cuff blank and file.



6 Shape the blank around an oval bracelet mandrel with a rawhide hammer.



7 When you are satisfied with the shape of the cuff, you're ready to start laying the stones into the channel.

Choose one end of the inlay channel to start work on and put a mark on it with your marker so you won't confuse which end you're working on. No matter how careful you were cutting and filing your silver, your channel won't be exactly the same at both ends. There is nothing more frustrating than shaping a stone for one end, finding it doesn't fit, and then realizing that you swapped ends!

I find it easier to work with slabs of a uniform thickness when inlaying, as you can pretty much see what your stone will look like once it's set. (If you have rough, I suggest you slab it before starting to inlay.) Begin by marking out sections on the slab that are 4 mm to 5 mm taller than the channel opening, but don't make your pieces too wide, as you will run into trouble with the curve of the cuff.

Use your trim saw to cut out the first stone section. True up one end and one side of the stone piece using a flat lap or a lapidary arbor, adding a slight bevel to it to accommodate the curve of the cuff. When you are happy with your end bevel, start fitting on the marked side. Once you have a good, tight fit on one end and one side of your stone, start fitting the other end and side. I like to put a very slight bevel on the sides so that the stone is wedged into the channel opening.

As you are fitting your stone, you may notice that the sides of the channel aren't as parallel as you thought, and in a wide cuff like this one, the 18 gauge back plate tends to "cup" when you form it. To compensate for this bulge, go to your Genie and put a curve on the back of your stone.

As you are fitting your stones, go slowly; take a little stone off at a time and re-check your fit often. Once you have one end and two sides fitted snugly, form the other end of the stone, once again adding a slight bevel to allow for the curve of the cuff. Try to keep both ends of each stone parallel to each other.

Once your stone fits, shape the top and polish it before you install it. Start shaping the stone with the 220 grit wheel on the Genie. You want a domed top from end to end, but not from side to side. Make sure you don't have any flat spots on the top before you proceed to the next wheel. Proceed through the wheels to the 3,000 grit wheel and finish off with the polish of your choice. Don't polish the edges now because it has a tendency to round them over, which will cause you to lose your tight fit.



PROJECT: INLAID CUFF *from page 35*

When you're finished polishing a stone, put a 2-inch-wide wide piece of masking tape on your bench and mix some 5-minute epoxy on it with a toothpick. The key to getting a good bond with epoxy is to mix it *well*, so when you think you've got it mixed up really well, mix it a little more.

Again, the mark on the cuff ensures you won't try to glue a stone into the wrong end. Use just a little more glue than you think you need. You want enough so that it squeezes out when you install the stone, but not so much that it gets all over the place. Install your stone, then clean up any excess glue with your toothpick. Then dip a cotton swab in acetone and clean up the residue. Repeat the sequence until your channel is filled up.

To add a piece of copper in between your stones, cut your metal the same size as your stones and file it to fit. Polish the top and sides. You can either insert it with epoxy when you install the next stone, or you can put a small drop of superglue on to hold the stone in place when you are fitting the next stone.

The only stone that is any different is the last stone, which is the hardest to fit. Start the same way as the other stones: fit one end, then one side, then the other side. Now you have to start on the final end. You will have to make a bevel on all the edges so the stone will slide in. Once again, go slowly. You'll find that when you take a little off one side, you have to take some off an end and vice versa. Just persist, and it will eventually fit. Glue it in place and clean up the excess. After the glue has set for about 15 minutes, remove the tape and clean up the metal.

To polish the sides of the stones, I use a wheel. Start with the medium silicon wheel and progress to the fine wheel. I also make sure and remove any overflow of epoxy that might be left between the stone and the metal. You can use a bristle brush on the polishing machine with bobbing compound on it to clean up any excess glue between the stones. (You can only do this with hard stones.) Give the cuff a final polish with Zam and clean off any remaining polishing compound with a mixture of Dawn® dishwashing liquid, warm water, and ammonia scrubbing it with a soft toothbrush. Be sure to do this in a well-ventilated area. 💎

E-mail the author at artistjeff54@gmail.com with any questions about this project.



8

Mark out a section of stone that's a little larger than the channel opening.



9

Use your trim saw to cut out the stone sections marked on your slabs.



10

True up one end and one side of the stone piece using a flat lap or a lapidary arbor.



11 Put a curve on the back of the stone to accommodate the “cupping” of the 18 gauge back plate.



14 Cut out your metal separator, shape and polish it like your stones, and epoxy in place.



12 Once your stone fits, shape the top and polish it before you install it in the channel.



15 Allow the glue to set for about 15 minutes before removing the tape and cleaning up the metal.



13 Mark the end of the cuff you'll be gluing the stone into, and mix your epoxy thoroughly.



16 Clean up and polish the sides of the stones with silicon wheels.

Viewing Rocks



These morrisonite (left) and New Zealand jade (right) pendants are too interesting to keep hidden away in a jewelry box.

The Rockhound's Display Dilemma

Story and Photos by Kathleen Fink

With so many rocks finding their way to our homes, it is not surprising that many collectors, sooner or later, face the dilemma of what to do with them all. The good news is that finding solutions can be a very rewarding aspect of the hobby. Just as a garden reflects the personality and desires of its creator, what we do with the rocks we collect is a highly personal matter.

Throughout history, people have gathered rocks for practical and spiritual uses and for their aesthetic appeal. Specimens have bestowed status and have been acquired as investments. Those with scientific knowledge regarding their composition and genesis tend to find all the more reason to appreciate them. (Interestingly, we are not the only species to display rocks in creative ways; male bowerbirds use rocks, as well as other bright objects, to decorate their elaborate courtship structures.)

Collectors soon learn that there is a limited window for obtaining the best examples when a new source is discovered, so we keep an eye out. We go on field trips and to shows, and meet fascinating people in the process. When we come across a desirable addition to our collection at a price we can afford, the temptation can be irresistible. What is more, a growing number of online sellers all over the world make it all too easy to obtain display specimens, rough and slabs, as well as polished or carved rocks.

While adventures may be involved in obtaining them, most rocks tend to be rather placid and well-behaved companions.



Rock collectors' gardens may have a few rare and interesting ringers hidden in plain sight among the more expected natural rocks.

Stable natural objects with the power to capture our imagination are all the more welcome given that, "Life is change/How it differs from the rocks" (Jefferson Airplane, "Crown of Creation"). Rocks connect us to an entirely different time scale, one that stands in stark contrast to our culture of rapidly-evolving technology.

While a child may be happy to keep finds in a cardboard egg carton, serious collectors have been known to commission beautiful, carved stands or to line entire rooms with lighted display cabinets. When aesthetic effect is a primary motivation, collectors may display these natural sculptures prominently on various surfaces in their homes. Carefully organized collections find their way into bookcases, cabinets, and many types of display cases. Add labels indicating type and other information, and a collection can move in the direction of becoming a private museum.

Collectors have found any number of creative ways to display their rocks: beneath glass tabletops, wire wrapped into rain chains, sewn into tapestries, and secured to various backings, including fireplace surrounds. Natural pebbles and carved rocks are used as playing pieces in games all around the world. Artists stack rocks into spectacular configurations or carve them into pleasing shapes. Burbling "rock music" results when stones are placed in fountains.

Slabs are placed in windows as sun-catchers, incorporated into stained glass-type windows and lampshades, and hung on wind chimes and mobiles. Slabs and cabochons are framed and hung on walls, while shadow boxes accommodate thicker specimens. When not being worn, jewelry containing special stones may be displayed in a variety of ways, including on elaborate custom stands.

Overflow rock specimens can be moved outdoors, placed along foundations, in planters, and in piles on decks and patios. When truly abundant, rocks are sometimes stored in crates lined up out back or are locked into wooden sheds.

Of course, some rocks are intended for the outdoors in the first place. They find homes in rock gardens—traditional or eccentric—walls and paths. They are important elements in many Asian gardens. Placing beautiful rocks in our yards and even on balconies can provide much lasting pleasure.

Photos can stand in for space-consuming and often valuable rocks that are stored out of the way and taken out from time to time, as desired. The visual appreciation developed in building a rock collection is directly applicable to taking rock portraits. Even beginners can achieve good results outdoors in natural light.



Unlike biodegradable sushi, these and the other rocks in my collection will outlast us all.



By arranging examples of a particular type of agate together in a bowl, I gain a better understanding of their common essence. These Fairburn agates have a lot going on.

While photos do not convey the tactile qualities of rocks, they can be excellent, clear, and close-up visual representations. The photographer's ability to perfectly position and light a rock influences our ability to appreciate it, and details are more visible and striking in enlargements. A well-respected rock photographer told me that his clients often say they prefer the photo to the rock itself. Digital super-macro technology now allows us to produce spectacular close-ups. A camera with this capability provides a whole new way to explore a collection that can produce surprises, as well as many artful images.

Photos, of course, are excellent for sharing. Calendars, cards, and other items with rock portraits make inspiring gifts. Enlargements and close-ups may be hung on walls. Booklets bound in inexpensive report covers serve as a way to share field trip stories and finds. A growing number of online forums with international audiences provide communities for sharing images and comments. For experts who write about their collections, crisp, high-resolution images are a must. Everyone wants to see prime examples, whether on a Web site or in a blog, book, or *Rock & Gem* article.

Professional photographers who specialize in taking photos of others' rocks, make their "collection" the whole world of beautiful and interesting rocks. It is important to respect their talents, as well as their often considerable investment in training, time and equipment, by obtaining permission before using their images for any purpose.

Organized collectors use photos to help document their collections so that important information is not lost. Having a photo, together with such information as the date acquired, mineral type, dimensions, location of origin (if known), features of note, and the seller's name and purchase price (if applicable), can prove invaluable for any number of purposes.

More than a few successful businesses started when collectors found a need to cull less desirable rocks from their growing collections. Those in the business of selling rocks may or may not have large collections of their own. After all, they get to enjoy a steady stream of desirable rocks passing through their hands, and in most cases they keep photographic records of their ever-changing inventory.

In my experience, a collection and the way it is displayed tend to evolve over time. As a child, I liked picking up natural rocks and playing with them in my room. My formal collecting began many years ago when my brother gave me a chunk of multicolor tourmaline.

I found a shop that carried tourmaline near where my family camped during the summers, in the White Mountains of New Hampshire. As I came to desire better crys-



▲ I kept trying to make all these cabochons get along on my computer table. Despite my best arrangement efforts, this did not happen and I gave up.

◀ This super macro close-up shows the details of what appears to be a rare bubble structure in an Agua Nueva agate.

tals, and as tourmaline prices in general rose, my collecting slowed considerably. I found a wooden spice rack with clean lines that holds my specimens to this day, with the exception of one larger specimen with blue and pink crystals penetrating quartz.

My rock collecting really took off when I discovered the world of agate and jasper. I remember doing an Internet search on the word "agate" just to see what would come up. Living in New England, I was not familiar with their diversity and amazing colors, and I was immediately entranced. I studied Web sites, read books and articles, and reached out to experts with questions.

As I began to make friends in the business, I was invited to visit locations where some of the types I loved were found. My vacations also began to include shows and

special agate symposia. Of course, I always brought back a few souvenirs. Happily addicted, I had acquired incredible friendships, as well as a growing collection of agates and jasper.

By luck, I happened to purchase a stack of large, old wooden bowls. I thought they were all the more beautiful for having been knocked about a bit and having survived a fire. When I bought the bowls, I had no specific plans for their use. It did not take long for me to realize, however, that they would be a good size to hold the various types of agate I collect, reducing visual clutter at the same time.

When I tried placing my Fairburn agates in one of the bowls, the immediate impression was one of sensuality, warmth, and vibrant energy. I could better sense the

spirit of Fairburn agates by taking in at one glance all the contrasts and similarities before me. I also sensed things going on that are difficult to put into words, but I was aware that stones related to their neighbors in interesting ways. I knew I was also seeing a reflection of my particular tastes and the forces that combined to allow me to collect those particular examples.

Arranging agates to my liking in those bowls turned out to be a time-consuming process of trial and error. I would prop individual agates against each other with their preferred faces up, while simultaneously balancing size, shape, pattern and color. I found this totally absorbing and quite satisfying, but I understand that others might find it a frustrating waste of time. Of course, there is no reason not to let rocks fall where they may into a bowl, an approach I used for tumble-polished jasper pebbles, with good results.

For some reason, my cat preferred the bowl of Fairburn agates. I would sometimes catch her with an intent look on her face, reaching in a paw to pull one out. I do not think she was simply dropping them to get my attention, as she seemed genuinely fascinated. Golda was careful not to disturb the remaining stones when she removed one, but woe betide the person who reaches carelessly into one of my painstaking arrangements.

I started to collect agate and jasper cabochons when I became aware of how well they frame delightful images without taking up much space. They often have distinctive personalities that I attribute in part to the lapidary artist's choices. At one time, I had many of them mingling at a "cab convention" on my computer table. I have mixed feelings about exiling most of these cabochons to storage, but I am happier without their constant squabbling with one another for attention.

At the same time as I was engaged with the lively agates and jasper, my appreciation for ordinary rocks, especially those with beautiful weathered shapes, found a focus outdoors. The house we purchased has an exposed granite mound resembling a large



Two wooden stands with asymmetrically arranged shelves hold small viewing stones.

turtle in the backyard. The bedrock that makes up much of the vicinity has collected our neighbors and us more than we have collected it, but I certainly appreciate the sense of deep time it conveys with its glacial scrape marks and coating of lichens.

As soon as I saw the view through the large kitchen window, I recognized the potential for a garden with a Japanese flavor. All that was needed by way of additional rockwork was a stepping stone path and a few small, ancillary rocks. When we replaced a retaining wall out front, I had an excuse to gather natural rocks and gravel for a rock garden. Some pieces of jasper rough made their way out to that garden, where it seemed to settle in quite well.

I saw what looked like a natural, hut-shaped stone on a stand in a business' window, and suspected my chances of finding one for sale were not good. Again, I turned to the Internet, read books, and

became friends with an expert. I had discovered the world of viewing stones. These natural stones are collected in a number of categories by shape; they may resemble animals or natural features like mountains and waterfalls, or have beautiful abstract shapes. They have a long tradition in China and Japan, where they are often displayed on beautifully carved wooden stands or in ceramic trays filled with sand or water. A growing group of enthusiasts in many countries find suitable stones in their own streams and mountains.

Although evocative viewing stones can be incredibly diverse as well as remarkably beautiful, I found that I was satisfied with a limited number. I find they have a large impact for their size, which can range from an inch to over 5 feet tall in the case of those found in Chinese gardens and in front of the Boston Museum of Fine Arts. Mine reside indoors on windowsills, on a wall shelf above my computer monitor, and even on top of the refrigerator. Two wooden stands with asymmetrically arranged shelves hold small ones, including some agate and jasper examples.

Over the years, I have been fortunate to visit collectors and see a wide variety of display approaches, from the resolutely functional to the highly creative. Regardless of the strategy used, rocks repay the attention and care taken with their display, as well as with the photos that represent them. As natural objects, there is always a freshness about rocks. They have the power to take our focus away from day to day irritations with their enduring mystery and beauty.

The rocks themselves, as well as the relationships and learning that go hand in hand with collecting, can add great richness to life. It is now my great pleasure to inspire others to collect rocks and to find their own ways to display and share them. I recently gave a framed poster of agates to a young boy, knowing that this might start him down the road to this rewarding hobby. As he left, the boy's father told me his son had asked how soon they could go to the beach so he could get some rocks. 💎



The early evening sun streams through this Laguna agate slab, which was intentionally positioned for this to happen.



A combination of display approaches allows me to gain much joy and energy from special rocks as I work.

ROCK & GEMKIDS

Orpiment

As_2S_3

Orpiment (arsenic sulfide) is found as small crystals with pyramidal terminations or in foliated (layered) form or as encrusting masses. Whichever form it takes, its color is a good identifier: lemon-yellow to bronze or orange-yellow. It leaves a lemon-yellow streak on a ceramic streak plate. It's a soft mineral (Mohs 1.5-2) with a resinous to pearly luster. Orpiment is an unstable photosensitive mineral, meaning it will turn dull and powdery under exposure to light, so you should not keep it in the open but enclosed in a dark cabinet.

Orpiment forms in low-temperature hydrothermal veins as well as in volcanic hot springs and fumaroles. It also forms as red realgar decays. Orpiment has been found in many countries: Russia, Romania, Macedonia, France, Iran, Peru, Japan and elsewhere, but while it may occur widely, deposits are usually small. Most specimens on today's rock and gem show market come from Hunan, China. In the United States, it's collected in Nye and Humboldt counties in Nevada and in Utah.

In days past, orpiment was ground and powdered by artists for use as a yellow pigment until new yellow pigments became available in the 1800s. It's also an ore of arsenic, with many uses in chemical and manufacturing industries. Its arsenic content calls for a word of warning. If you have orpiment in your collection, don't



Orpiment with white dogtooth calcite crystals

handle it without gloves. If you do, wash your hands right afterward. Pure arsenic is a poison and while orpiment is arsenic sulfide, it should still be treated with respect and handled as little as possible. My own specimens are kept in plastic boxes inside a drawer.

—Jim Brace-Thompson

Paper Shale and Its Spectacular Fossils

Shale is a sedimentary rock composed of compacted layers of mud laid down on seafloors and lake beds. Usually rock-hard, it takes a hammer whack to split a piece between bedding planes, but one type of shale can be split apart with your fingernails: paper shale. Paper shale was deposited in extremely tranquil freshwater lakes in areas punctuated with volcanic activity that spread ash. Layers are paper-thin and alternate between very fine shale (often mixed with diatoms) and volcanic ash. Such shale is said to be thinly laminated, and it's often white, gray, brown, or black. The darker shales typically have high concentrations of carbonaceous material, or petroleum. The thin laminae tend to separate on weathering into tough flexible sheets, like thick paper.

Shale often contains fossils, and the level of preservation in paper shale is astonishing. You can make out soft tissues, color patterns on insect wings, stomach contents of fish or reptiles, even individual hairs and antennae. The ash from volcanic eruptions both killed and buried organisms quickly, creating what are called anoxic (oxygen-free) conditions. Lack of oxygen slowed the decaying process and rapid burial prevented the dead plants and animals from being torn apart by scavengers. Deposits with such high preservation of a diversity of organisms are known as Lagerstätte.

Famous Lagerstätte deposits of paper shale include Florissant, Colorado and Liaoning Province of northeastern China. Florissant deposits are from the end of the Eocene Epoch (33-34 million years) and include leaves and insects. Liaoning is from early Cretaceous Period (133-120 million years) and records a whole ecosystem: insects, shrimp, fish, amphibians, reptiles, birds, even feathered dinosaurs. This so-called Jehol Biota also includes Mayfly



Layers of "paper shale" are literally paper-thin.



Fossil Lycoptera fish in paper shale

nymphs Ephemeropsis and the fish Lycoptera, both sold in abundance at shows and in rock shops.

—Jim Brace-Thompson

Indiana's State Rockhound Symbol

In 1971, Indiana Code 1-2-9-1 proclaimed: "The regal type rock 'Limestone' which is found and quarried in south and central Indiana from the geologic formation named the Salem Limestone, is hereby adopted as the official stone of the State of Indiana."

Salem Limestone is considered a "chemical stone" because it is nearly pure (97%) calcium carbonate. That purity provides a uniform texture, allowing Salem Limestone to be cut to any size or shape, which has given it a reputation as an excellent "dimension stone" for architectural use and decoration.

The area around Bedford ("Limestone Capital of the World") hosts this fine stone. Limestone quarried and carved in the Bloomington-Bedford district is featured on buildings across America. It adorns the Indiana State House and Indiana University, as well as the new Yankee Stadium, the Pentagon, the Empire State Building, and the U.S. Holocaust Memorial and Museum. It helped rebuild Chicago after the Great Fire of 1871 and is in many buildings at the University of Chicago.

Richard Gilbert opened Indiana's first limestone quarry in 1827, and the industry has seen ups and downs. The zenith of American-stone architecture was in 1929. That year, Indiana supplied America with 14 million cubic feet of stone from 70 quarries. Although greatly reduced from its heyday, the Indiana limestone industry still generates \$26 million annually, and it provided the backdrop to the 1979 movie "Breaking Away".

Indiana limestone is a sedimentary rock, part of a sequence of deposits that originated in inland seas during the Mississippian Period, 330 million years ago. Salem Limestone, specifically, can be seen in outcrops extending northwesterly from Floyd through Montgomery counties. It's also popular among fossil collectors; for instance, see my November 1993 *Rock & Gem* article about collecting microfossils near Salem. Not only is it beautiful for building, it's fun to collect!

—Jim Brace-Thompson



Indiana limestone outcrop



Crinoid fossil in Indiana limestone

Dangerous Minerals Word Search

AMPHOBOLITE
ANTIMONY
ARSENOPYRITE
CHALCANTHITE
CINNABAR
COLORADOITE
CROCIDOLITE
ERIONITE
GALENA
HUTCHINSONITE
HYDROXYAPATITE
LEAD
ORPIMENT
PYRITE
STIBNITE
SULFUR
THORITE
TORBERNITE
URANINITE
ZIRCON

J	T	N	R	A	B	A	N	N	I	C	T	O	R	P	I	M	E	N	T	B	O	L	S
O	I	Y	P	L	K	R	E	J	A	R	M	V	A	N	D	O	S	W	I	X	R	Y	T
D	L	C	H	A	L	C	A	N	T	H	I	T	E	P	L	E	A	D	N	U	K	D	I
H	B	L	S	I	D	F	O	M	Z	O	R	T	Q	S	H	X	T	S	F	O	T	A	B
Y	N	U	B	G	A	L	E	N	A	S	I	C	M	O	D	E	I	L	T	R	E	P	N
D	Y	E	L	I	T	R	N	Y	B	R	P	E	L	N	T	A	U	C	S	O	T	L	I
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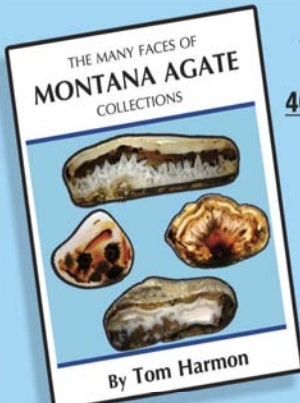
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The Hartman ROCK GARDEN



MINDY COOPER PHOTO

Built in the narrow side yard of a quaint Cape Cod home, the garden contains more than 50 handcrafted stone sculptures that are close to 82 years old.

The Legacy of an Unintentional Rockhound

Story by Mindy Cooper

Nestled in the center of a small residential area in Springfield, Ohio, the Hartman Rock Garden is a local landmark. Built in the narrow side yard of a quaint Cape Cod home, the garden contains more than 50 handcrafted stone sculptures that are close to 82 years old. To passers-by it serves as both a conversation piece and a reminder of the city's history.

Started by Ben Hartman in 1932, the garden is now an American Folk Art site. At the start of the Great Depression, Hartman was laid off from his job as a molder. Because he loved to fish and was not a man to sit idle, he began building a fishing pond in his yard. He dug out the area for the pond, lined it with concrete, and built a ledge around it with grey dolostone.



MINDY COOPER PHOTO

Constructed with concrete, stream gravel and red granite, the Tree of Life is a favorite among folk art enthusiasts and is considered the garden's signature piece.



Hartman's replica of the White House was made from concrete and granite. He often referred to photographs when creating small versions of historical landmarks.



The Little Church Around the Corner sculpture was created with concrete, stream stone, and glass windows. It was Ben Hartman's first stand-alone piece.

In the center of the pond, he constructed a birdbath from concrete and stream stones, and then filled the pond with goldfish and water lilies. By the time he finished, he not only had a personal "fishing pond", he had a lifelong hobby—a hobby that would go on to become his legacy to the Springfield community, as well as folk art and lapidary aficionados across the nation.

Born Harry George Hartman in 1883, in Edenville, Pennsylvania, Hartman started learning the molding trade when he was 16 years old. He eventually moved to Springfield to work at the Springfield Machine Tool Co. foundry. After 1930, he married Mary Johns. The couple raised three children together: Ruth, Martha and Benjamin. Mary recalled to a reporter in 1987 that her husband earned the nickname "Ben" when he was young because he had always "been" fishing. It's fitting, then, that constructing a fishing pond led him to the next great hobby of his life.

FAMILIAR MATERIALS

Hartman used materials and tools that were readily available and familiar to him in his creations. The couple drove their 1934 Chevy to a nearby farm, where they gathered small stream stones and large glacial rocks. They visited a local lime quarry for the dolostone. In addition to the natural rock sources, a monument company in Xenia gave Hartman leftover granite; all he had to do was pick it up.

He used a sledgehammer to break apart larger rocks, and broke apart red brick and other rocks with a hammer. Mary said that her husband wore out three hammers while building the garden.

When building a structure with a unique shape, Hartman created a form from chicken wire and then added the concrete with a trowel. Most importantly, he used his hands to sculpt the cement and arrange the stones and rock.

THE STAND-ALONES

Hartman lived until 1944 and during those 12 years he worked steadily on the rock garden. After the rock pond, he began creat-



The first structure Hartman built in his future rock garden was this small “fishing” pond, using cement and dolostone.

ing stand-alone structures based on three themes that he held dearly: education, religion and country. He carefully placed each item in the garden in a way that would showcase the flowers that he and Mary had taken great care to plant and maintain.

He started by making what he referred to as “The Little Church Around the Corner”, which was modeled after The Church of Transformation in New York City, where celebrities of the era often got married. The church was created using cement and mixed stone. Hartman included stained glass windows in the design, as well as carpet and statues of a bride and a groom inside the building.

Hartman often referred to photographs when creating small versions of historical landmarks. He made a version of Abraham Lincoln’s cabin home, George Washington’s Mount Vernon estate, and the White House. If he didn’t have a photograph, he would create his own interpretation.

In addition to the structures, Hartman developed a talent for making statues from cement. Drawing on his training as a molder, he created molds from existing statues and then put his own twist on them, changing the shapes and poses. Some of his personal favorites were of Mae West, Sitting Bull, and the Virgin Mary.

Neighbors began to drive by the house to see what had been added since the last time they had been past. People also started bringing rocks to be used in the structures. Eventually, the couple started giving tours, and though they never charged for them, visitors often made small donations. At the time, a bag of cement cost 50 cents, and Hartman would use the tour money to



A canoe built of concrete, stream gravel, and mixed stone serves as a planter for multicolor flowers.

buy more. Mary recalled that her husband got as excited about a bag of cement as a child with a new toy.

LARGER SCALE

Eventually, Hartman’s skill surpassed the 1- to 3-foot structures, and he moved onto much more ambitious projects. Using a postcard photograph of a castle in West Virginia as his guide, Hartman used cement, dolostone and mixed stone to build a 12-foot castle, complete with a drawbridge, cement moat, and 107 windows. Hartman said the castle contains 100,000 stones and took him 14 days to complete.

Even his workshop turned into a piece of artwork. On the outside of the shed that he worked in, he created a 14-foot-high Italian-style cathedral from dolostone and cement. In the arches he placed religious-themed statues, including a recreation of Leonardo DaVinci’s *The Last Supper*.

THE SIGNATURE PIECE

In the center of the garden, within a circular flowerbed, stands Hartman’s “Tree of Life”. The tree is 7 feet tall and shaped like a cactus. Each of Hartman’s three themes are represented in it. One arm holds a schoolhouse, meant to symbolize education, and

MINDY COOPER PHOTO

MINDY COOPER PHOTO



The castle, made of concrete, gray dolostone, and mixed stone, stands 12 feet tall and contains 100,000 stones.



A fan of Abraham Lincoln, Hartman built a replica of the cabin he was born in, using concrete and cobblestone.

the other a church, to symbolize religion. On the top, is an eagle standing above a shield designed to look like the American flag, to symbolize country. Hartman used 20,000 stream stones, as well as red granite and concrete, in the construction of the tree. The piece is a favorite among visitors who are fans of folk art.

CARRYING FORWARD

Hartman once told his foundry friends, "I don't want to leave my yard full of tin cans ... I want to leave it worth something." That's exactly what he did. When he passed away in 1944 from a lung condition, Mary became the caretaker of the garden. Her dedication to the garden was reported on by local newspapers. Though Mary didn't build any new stone pieces, she was devoted to maintaining the garden the way that her husband had. She continued giving tours of what she called her "Garden of Love".

When Mary passed away in 1997, the house and the garden went to the couple's son Benjamin. By the time he passed away

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WHAT TO CUT

by Scott Empey

Cherry Creek Jasper

I first came across Cherry Creek jasper six or seven years ago, oddly enough, up at the Polka Dot agate mine in Oregon. The owner had barrels of it, recently imported from China. It was reasonably priced and, since I just can't resist a barrel of new rock, I picked out a nice batch to take home and play with.

Since then, it has become quite popular with lapidaries and jewelry designers. It is known by several names, the most prevalent being Cherry Creek and Red Creek jasper. There seems to be some confusion between it and Picasso jasper; these are two distinct materials and are found on opposite sides of the world from each other.

Cherry Creek jasper comes in a beautiful palette of colors with a wide variety of interesting patterns. The colors can include varied shades of green, red, blue, orange and yellow. Much of it is characterized by brecciated patterns, the former fractures healed with colorful silica. Some of the jasper is vivid apple red and yellow, while other pieces are a more subdued green, crisscrossed with tan or yellow and green streaks.

When cutting from rough, it is pretty hard to tell what is inside just from looking at the outside. What is revealed by the first cut is often a happy surprise. Most pieces are pretty nondescript on the outside, but even the most unremarkable looking pieces can contain a great display of colors and patterns. If you are looking for specific colors or patterns, it's probably easier to look for slabs to start with.

Cherry Creek jasper is reasonably priced and readily available; slabs are sold on eBay and other online sources, and there are several sources for rough, pieces of which can be up to 10 pounds. I may have picked up an exceptionally good batch, but every piece I got had something worthwhile going on inside.

This jasper is a fairly solid material, with a hardness around Mohs 6, but not very dense, making it pretty user friendly for the cutter. Once you have some slabs to consider, clean them, dry them off, and look closely for dry cracks, which have a tendency to break during the rough cutting phase. Usually, I just see if I can break them by hand and make my stones from the areas in between.

If the suspect cracks go through an area that I really want to maintain, I stabilize them using cyanoacrylate adhesive, com-



monly called superglue. There are several varieties of superglue; you want to use the thin, watery kind and avoid any of the gel mixtures.

First, I warm the slabs on top of a space heater so the glue can penetrate deeper into the dry areas. After I apply the sealant, I return them to the heat source so the adhesive sets nice and hard. Once you have trimmed and roughed out your cabs, the cutting is pretty easy. If I have stabilized any of the lines, I usually re-apply the adhesive after the 220 sanding step to make sure the area will be solid below the finished surface.

Since this jasper is a fairly soft material, I find that I can skip the 400 sanding step and go right to a newer 600 belt, which saves some time. I finish sanding with a worn 1200 belt, running it mostly dry to burnish the surface a little bit before polishing. Some pieces will polish better than others, depending on their silica content.

I find that, with this material, it is beneficial to add a couple of tablespoons of white vinegar to your polish. The vinegar lowers the pH of your mixture, and the increased acidity will help you get a glossier finish. I can't tell you exactly why it works, but it works like a charm on any silicated rocks, like Noreena and Sonora picture jaspers and rhyolites. 💎

Scott Empey, owner of Gerard Scott Designs, creates hand-cut gemstones, designer jewelry, and props for the motion picture industry. His Web site is www.gerardscottdesigns.com.



MINDY COOPER PHOTO



Made of concrete, dolostone and chert, the Italian-style cathedral is the largest structure in the garden, standing 14 feet tall.

in 2007, the garden was beginning to show signs of deterioration.

The Hartmans' granddaughter became determined to preserve what had become her grandparents' legacy, a valuable part of their community and of her family's history. She contacted the Kohler Foundation, a nonprofit organization based in Wisconsin that specializes in the preservation of folk architecture and collections of works created by self-taught artists. The uniqueness of the garden attracted the foundation's attention.

"We loved that the sculpture was constructed of varied examples of stone, that gardens were incorporated into the site, and that it was simply good art!" said Terri Yoho, Executive Director of the Kohler Foundation. "The site is compact and densely populated with sculptures. It draws you in as if entering a storybook setting of castles, figures, structures, historical references, and so on. A fabulous imaginary world!"

Foundation staff members worked with professional art conservators and members of the Springfield community to develop a plan for the garden. Each sculpture was evaluated, and then cleaned, stabilized and repaired.

"Local volunteers and craftspeople were invaluable during this process," Yoho said.

The Kohler Foundation didn't plan on maintaining ownership of the garden, so The Friends of the Hartman Rock Garden, a nonprofit collaboration of the Turner Foundation, the Springfield Foundation, and the Springfield Art Museum, was formed to care for the garden. When the eight-month preservation project was complete, the garden was gifted to the group.



MINDY COOPER PHOTO

The concrete replica of La Rabida Monastery, where Christopher Columbus consulted with the French about his journey to the New World, includes statues of Columbus and his three ships.

"The garden is also a major part of Springfield's collective identity. Residents have been enjoying the garden for generations," said Kevin Rose, Historian for the Turner Foundation. "At the same time that guests are visiting from Texas or California, a family will stop by from down the street. Some have been visiting since the days of Ben Hartman. Some have helped care for the garden during its less fortunate days. The Hartman Rock Garden holds a special place in so many hearts."

In the future, The Friends of Hartman Rock Garden plans to set up Hartman's

original workshop and hold small hands-on classes that will teach people how to make their own sculptures with concrete and stone in the same manner in which Hartman did.

The garden is still regularly visited by residents of the local community, family members, and friends of the Hartmans, as well as lapidary and folk art enthusiasts. Visitors still drop off rocks. The garden, located at 1905 Russell Ave., is open 365 days a year, from dusk to dawn, and welcomes visitors at no cost, though donations are accepted. 💎

Colorado's

YULE QUARRY

STEVEVOYNICK PHOTO



This 8-foot-long sculpture of horses, carved from Yule Marble, adorns the entrance to a Marble, Colorado, art gallery.

It's the Source of the World's Best Marble

Story by Steve Voynick

Visiting Colorado's Yule Marble quarry in the 1970s, I found a lot of history—but little else. Standing on a steep mountainside at an elevation of 9,300 feet, I peered through a gaping rock portal into a huge, dimly lighted quarry that was located entirely *within* the mountain. Rusted cables and frayed ropes dangled from timber derricks; the quarry floor was covered with huge blocks of white marble that had been cut decades earlier from a 100-foot-high interior wall.

STEVEVOYNICK PHOTO



Many sculptors and architects consider statuary-grade Yule Marble the world's best.



This newly developed portal provides a dramatic view of the interior of the Yule Quarry, which is entirely inside the mountain.

Even the little town of Marble, four miles distant and 1,300 feet lower, was nearly deserted. Boarded-up houses lined the empty streets, and the town's population, once as high as 2,000, had dwindled to a mere handful. Like headstones, blocks of white marble were everywhere: in weed-strewn yards, in the swirling waters of the nearby Crystal River, and especially at the long-abandoned Marble Mill Site.

But since then, the Yule Quarry and the town of Marble, hidden away in west-central Colorado's West Elk Mountains, have been reborn. When I revisited Marble in 2014, its population had grown to 150, two art galleries featuring sculptures of Yule Marble were open, and the Yule Quarry was again shipping blocks of gleaming, white marble. The many visitors included photographers seeking shots of mountain scenery, sculptors acquiring marble for their studios, sculptors-in-training attending stone-carving symposiums, history buffs tracing the story of America's most remarkable marble quarry, and rockhounds collecting specimens of what is considered the world's finest marble.

Marble's history is a rollercoaster of good times and bad. A century ago, the booming town provided the flawless white marble for the Tomb of the Unknown Soldier (the Tomb of the Unknowns), the Lincoln Memorial, and hundreds of other monuments



The exterior of the Lincoln Memorial in Washington, D.C., is covered entirely in Yule Marble.

and public buildings around the country. But hard times followed when the Yule Quarry was forced to close in 1941, and Marble nearly became a ghost town. Today, however, Marble's future again seems bright, thanks to a reopened Yule Quarry and renewed demand for the beautiful metamorphic rock called marble.

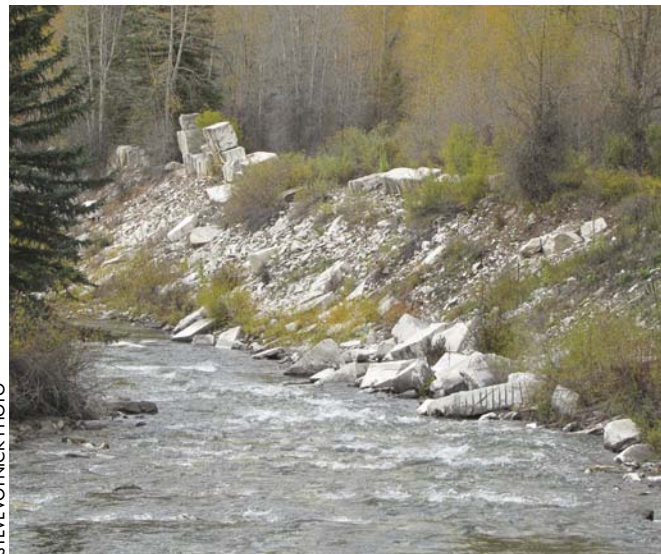
Marble is classified as a rock, rather than a mineral, because of its variable chemical

composition. In its petrological context, the term "marble" refers to a metamorphosed form of calcitic or dolomitic limestone. In industrial and artistic usage, the term generally refers to any polished form of altered or unaltered limestone, as well as such ornamental rocks as alabaster and travertine.

Limestone is a sedimentary rock that consists of at least 50% calcite (calcium carbonate) and/or dolomite (calcium magne-



STEVE VOYNICK PHOTO



STEVE VOYNICK PHOTO

In Yule Marble and other fine marbles, millions of tiny calcite crystals scatter and reflect light to create a soft translucency.

In places, tons of white Yule Marble line the banks of the Crystal River at Marble.

sium carbonate). Limestone becomes marble when it is metamorphosed, or altered by heat. Marble is a dense, evenly grained, completely recrystallized metamorphic rock that is soft enough to scratch easily with a knife blade.

The highest grades of marble are generally light in color and consist of over 90% calcite or dolomite. The harder, lower grades, which are metamorphosed from low-calcite, high-silica limestone, are dark gray in color and are classified as "calc-silicate rock".

While the purest marble is snow-white, most marble contains varying amounts of accessory minerals that create a wide range of usually pale colors. Minerals such as hematite and diopside, along with limonite (an indeterminate mix of iron oxides and hydroxides) and those of the hornblende group, can color marble various shades of red, pink, yellow, brown or green. Magnesium imparts golden hues, while residual carbonaceous materials produce gray or almost black shades. The uneven distribution of accessory minerals or carbonaceous materials often creates attractive "marbled" patterns of swirls, spots and veins.

The most desirable marble forms from very high-grade limestone and has a soft, subtle translucency. This translucency creates an almost luminescent glow that is caused by calcite's low refractive index, which enables light to penetrate a few millimeters into the marble before scattering and reflecting back. This omnidirectional reflection gives fine marble its characteristic "waxy" appearance and a warm, almost lifelike appearance.

Marble was the preferred architectural material and sculptural medium of the ancient Greeks and Romans. The quarries at Carrara in northern Italy's Apuan Alps yielded extraordinary marble that is still admired in surviving Roman buildings, monuments and sculptures.

The finest Carrara marble was known as *statuario*, which literally means "statue-grade". Millions of tiny calcite crystals, each with highly reflective cleavage surfaces, create the soft, lustrous glow that led the Romans to claim that these tiny, glittering crystals, called *luchiche*, were the tears of Christ. Roman quarrymen also believed that the Carrara *statuario* beds regenerated to assure an endless supply of fine marble. And for nearly two millennia, Carrara set the standard for fine marble—until the discovery of Colorado's Yule Marble.

The geological story of Yule Marble began in the Paleozoic Era some 350 million years ago, when a Mississippian sea deposited a massive formation of fine-grained, fossiliferous limestone in what is now central Colorado. Most of this formation, called Leadville Limestone, contains considerable amounts of carbon derived from organic sediments that produce a dark-gray color. Some strata, however, consist of relatively pure calcite and have a grayish-white color.

Some 60 million years ago, magmatic intrusions associated with the Laramide Orogeny, the mountain-building episode that created the Rocky Mountains, penetrated sections of the Leadville Limestone and its associated strata of shale and sandstone. At the present site of Marble, tremendous magmatic heat in the contact zones altered the shale into slate and the sandstone into quartzite.

But the most dramatic metamorphosis occurred within the grayish-white strata of high-calcite limestone. Direct magmatic contact heated this light-colored limestone to a plastic state, driving off carbon impurities as carbon dioxide and destroying the tiny, marine-fossil structures. As this calcite-rich limestone slowly cooled, it recrystallized as strata of dense, fine-grained, snow-white marble.

Geologist Sylvester Richardson discovered this white marble in 1873 and prospector George Yule, for whom the deposit would be named, "rediscovered" it in 1874. But after specimens attracted little attention in Denver, the outcrop was forgotten. Gold prospectors stumbled across the outcrop again in 1884. This time, Denver newspapers described polished specimens as "the purest white marble".

After a small quarry opened in 1887, laboratory analysis of the marble, now called "Yule Marble", pegged its calcite content at a remarkable 99.5%. In 1890, architects designing Colorado's new state capitol building specified Yule Marble for the building's floors. Months later, architects at a major St. Louis trade exposition equated the beauty, color and flawlessness of Yule Marble with that of the best stone from Carrara.

Italian marble experts subsequently classified Yule Marble into five grades. Among them was top-grade "statuary" marble, named after Carrara's *statuario*. It was snow-white, dense, evenly grained, and free from veining. "Second statuary" had only a few barely perceptible, hairlike, brownish-yellow veins. "Crystal", the lowest grade, was a dark-gray, very coarse-grained, calc-silicate rock.

Anticipating an immediate marble-quarrying boom, optimistic promoters named the small camp on the Crystal River that served the Yule Quarry "Marble". But their hopes were premature, for the area proved prone to avalanches and flash floods, while its lofty elevation made for long and difficult winters. Furthermore, the cost of shipping heavy marble blocks by wagon from the remote quarry was prohibitive.

But the biggest problem was marketing. Unlike most mineral resources, marble is not a market-ready commodity, but a material for which buyers must be waiting before blocks are quarried.

Meanwhile, geologists were finding that various types, grades, and colors of Yule Marble occurred in a seven-mile-long, 600-foot-thick bed. Colors ranged from snow-white to hues of green, pink, roseate, yellow, bluish-white, and brownish-tan; an associated calc-silicate rock had dark, bluish-black colors. The economic heart of this deposit was a 100-foot-thick bed of statuary marble that adjoined a 125-foot-thick bed of slightly coarser, white marble. Several 50-foot-thick sections of this statuary marble were flawless.

In 1900, the Crystal River Railroad reached Marble and the Colorado-Yule Co., owner of the Yule Quarry, began full production. Initially, its crude hardrock mining techniques proved inefficient and wasteful for quarrying marble. But quarry workers quickly refined their drilling and blasting methods, and learned to flood declined drill holes, allowing the water to freeze so that the expanding ice would gently break the marble into blocks.

By 1906, the arrival of experienced Italian quarry masters and new electric channeling and sawing machines had increased production. Working along right-angled benches, these machines cut or chiseled top and side channels into the marble walls. Quarrymen drilled tight rows of bottom holes into which they gently drove “feathers and plugs”—wooden and metal wedges—to cleanly separate the blocks.

As quarrying lowered the floors, timber derricks were erected to lift marble blocks to the portals. Electric trams then hauled the blocks along the steep, downhill, four-mile-long run to Marble. With individual blocks weighing as much as 25 tons, this dangerous, slow method of haulage strained both steel cables and human nerves.

In 1908, several cities placed major orders for Yule Marble for new public buildings. That year, Colorado-Yule shipped the



At the entrance to the Marble Mill Site Park, visitors are reminded that collecting specimens is prohibited.

largest marble block—28 feet in length—that had ever been quarried anywhere in the world. In 1910, with 600 workers supplying marble for new buildings from Boston to Los Angeles, Colorado-Yule built a huge, 1,465-foot-long finishing mill. This fully mechanized mill used cutting wire with sand-slurry abrasives to slice through marble “as if it were butter”. After diamond-studded finishing saws shaped the blocks, belt-operated “rubbers” polished them to gleaming smoothness.

In 1912, the U.S. Commission of Fine Arts specified Yule statuary marble for the columns of the planned Lincoln Memorial. The “Lincoln contract” called for flawless sections for 36 fluted columns, each of them 46 feet high and 7 feet in diameter. Despite three consecutive winters of heavy snow and avalanches, Colorado-Yule filled the contract in 1916 by quarrying and finishing 1,800 blocks, some weighing 30 tons each. Six hundred railcars conveyed the column sections to Washington, D.C.

But when World War I curtailed domestic construction, Colorado-Yule lost many contracts before falling into receivership in 1917. By then, it had produced 1 million tons of fine marble worth more than \$6 million.

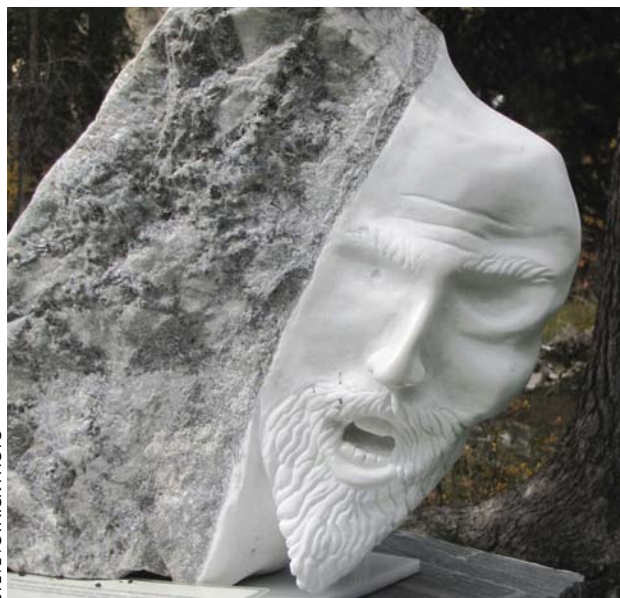
After new owners took over the quarry, a fire destroyed the mill in 1925. The Vermont Marble Co. acquired Yule in 1928, resuming operations just in time to accept the most prestigious marble contract ever awarded: supplying the stone for the planned Tomb of the Unknown Soldier. Yule was the only source that could provide a large enough block of flawless, statuary marble.

A special 75-man crew spent a year quarrying the 124-ton block of marble, which still the international quarrying record, only to have it rejected because it had barely perceptible smoke-colored veining. The crew then quarried a second block, trimmed it to 56 tons, and shipped it to Vermont for sawing and polishing. In November 1932, workmen emplaced the finished block at Arlington National Cemetery in Arlington, Virginia.

At the start of World War II, the federal War Production Board declared marble nonessential to the war effort and ordered the Yule quarry closed. At the same time, torrential thunderstorms triggered flash floods and landslides that destroyed both the railroad and the only access road. Overnight, Marble became a ghost town.

The quarry then remained inactive for a half-century before it was reopened in 1992 by the Colorado-Yule Marble Co. Operations initially lasted only a few years, though production resumed in 1999 to fill a federal Veterans Administration order for national-cemetery headstones.

In 2004, the Canadian company Polycor Stone Corp. acquired and operated the quarry, but it, too, failed following the financial crisis of 2008. Three years later, the R.E.D. Graniti Group, a partnership between R.E.D. Graniti S.P.A. and Locati Luciani Enrico & C.S.A.S., both of Carrara, Italy, purchased the Yule Quarry. The R.E.D. Graniti Group now operates the



The razor-sharp contact high-grade, calcite-rich limestone and low-grade, calc-silicate rock is visible in the sculpture “Rock Man”.



The Yule quarry’s production history includes the largest marble block—28 feet in length—that has ever been quarried anywhere in the world.



quarry under the name of Colorado Stone Quarries Inc.

The cavernous, cathedral-like quarry looks today much as it did decades ago. The roof soars 100 feet above the floor and sheer walls bear the rectangular patterns of cuts and grooves made by quarrymen a century ago. The marble formation is remarkably stable; the only ground support needed is the room-and-pillar quarry design and occasional rock bolts.

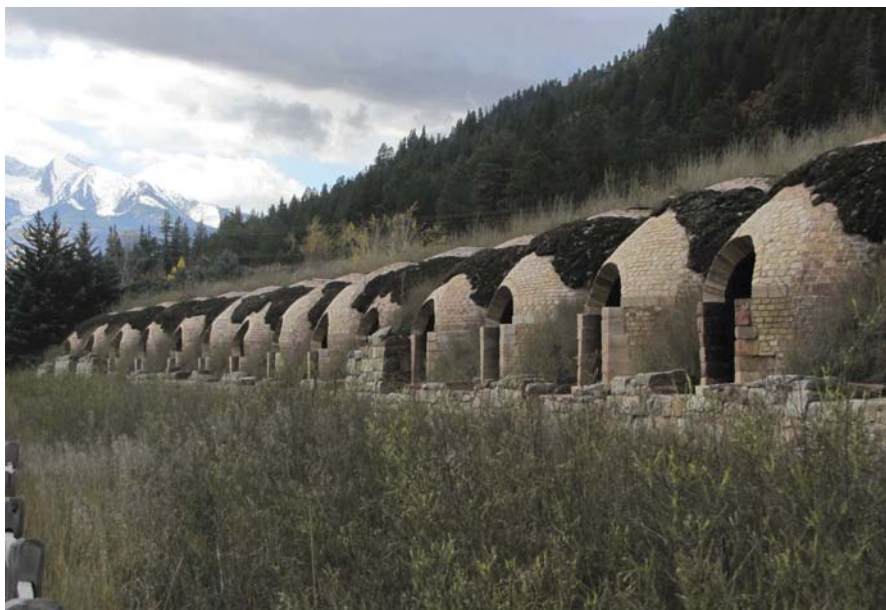
Quarrying at Yule is a delicate balance of mining and art and relies on many traditional techniques developed at Carrara. Quarrymen use long cables sleeved with diamond-studded tubular bits or 10-foot-long, electric chain saws with blades tipped with tungsten-carbide bits that take only two hours to cut through 6-foot sections of solid marble. "Water bags", the modern version of the old "feathers and plugs", consist of thin sections of sheet metal welded together with hydraulic fittings. After being inserted into narrow wall channels, the bags are pumped full of water so that their slow, even expansion gently breaks the rock. The Yule Quarry now employs 20 workers and ships the bulk of its production to Italy, other parts of Europe, and Asia.

From Marble, the quarry is accessed by a steep, unpaved road that often narrows to a single lane. Edged by sheer drop-offs, this road is exceedingly dangerous—even without the presence of heavy quarry equipment and trucks loaded with huge marble blocks. Because of the danger, the road and all quarry property are closed to all unauthorized visitors.

Although the quarry is off-limits to the public, the town of Marble has many marble-related attractions. At the Colorado Stone Quarries' "load-out" yard near the Crystal River, huge blocks of newly quarried Yule Marble—many measuring 6 feet by 6 feet by 8 feet and weighing 25 tons—can be seen awaiting shipment.

In and around Marble, hundreds of marble blocks have been used for everything from building construction and yard decoration to avalanche-diversion walls. Many blocks, quarried long ago but rejected because of fracturing, imperfect cuts, or flawed colors, protect the banks of the Crystal River from erosion.

A big attraction is Marble Mill Site Park, a National Historic Landmark owned by the town of Marble. Within this 25-acre park stand the remains of the Yule mill, once the world's largest marble-finishing mill, which was scrapped during World War II. A row of massive marble pillars, each 25 feet high and 8 feet wide at the base, once supported overhead cranes. Today, these pillars remind many visitors of ancient Greek ruins. Scattered throughout the park are dozens of white marble blocks and column sections. Even the picnic tabletops are made of 5-inch-thick slabs of white marble.



Brick coke ovens at Redstone, Colorado, once converted bituminous coal into coke for steelmaking use.

Two local art galleries are filled with dozens of sculptures and decorative items, all carved from white, statuary-grade marble. The sculptures range in size from a few inches to longer than 6 feet, and cost from a few dollars to thousands of dollars. Marble items include cutting boards, paperweights, bookends, figurines, and wall hangings.

Marble has also become a center for education in the art of stone carving. Each summer, the Denver-based Marble Institute of Colorado, an organization that furthers the education, training and development of stone carvers, conducts three intensive, eight-day-long stone-carving symposiums at Marble. Students of all ages and levels of experience work under the guidance of nationally recognized sculptors to carve their own creations from statuary-grade Yule Marble. This annual "Marble/marble Symposium" draws sculptors-in-training from around the world.

Many sculptors and mineral collectors consider Yule Marble the most beautiful rock in existence. That view was supported in 2004, when the Colorado legislature formally designated Yule Marble as its official state rock.

Specimens of Yule Marble are easily collected around Marble, sometimes literally from the side of the road. However, marble may not be collected at Marble Mill Site Park, where removal of marble, artifacts, or any other materials is prohibited. Art galleries and Colorado Stone Quarries Inc. both sell rough statuary marble at modest prices.

Another interesting stop near Marble is the town of Redstone, 10 miles to the north. Named for the surrounding cliffs of Pennsylvanian red sandstone, Redstone is a former coal-mining town where hundreds of large, dome-shaped, brick ovens once

converted bituminous coal into coke for use in steelmaking. Redstone's long rows of century-old brick ovens are an often-photographed attraction.

In Redstone, the Redstone Art Gallery displays dozens of beautiful Yule Marble creations in an outdoor sculpture garden along the Crystal River. Especially interesting, certainly from the petrological perspective, is a work by sculptor Melissa Hesse titled "Rock Man". Half of this sculpture, which was carved from a single block, consists of statuary-grade, white Yule Marble and depicts a human face; the other half is coarsely crystalline, dark gray, partially metamorphosed "calcite crystal".

The razor-sharp contact represents the border between two adjoining strata of Leadville Limestone, one a high-grade, calcite-rich limestone, the other a low-grade, calc-silicate rock. The sculpture is a textbook example of how rocks of differing chemical compositions react in radically different ways to the heat of contact metamorphism.

Hidden away in the mountains of west-central Colorado, Marble is 50 miles south of Glenwood Springs and Interstate 70. From Glenwood Springs, take state Route 82 south for 12 miles to Carbondale (last chance for gas), then follow state Route 133 south for 23 miles through Redstone to the junction of Gunnison County Road 3. Marble is five miles south at the end of the paved county road. Given the 8,000-foot elevation, late spring, summer, and early fall are the ideal times to visit; winter driving conditions can be difficult.

For further information about the quarry and its product, contact the Marble Tourism Association (www.marbletourismassociation.org) or the Marble Institute of Colorado (www.marbleinst.org). ♦

12 & under free; Over 15 dealers; gem, mineral, jewelry and beads. Member and dealer displays, silent auction, grab bags, garnet tables and raffles.; contact Jerry Hancock, P.O. Box 11001, Bozeman, MT 59719; e-mail: Jaegers@bresnan.net; Web site: bozemandmineralclub.com

9-10—GRAND JUNCTION, COLORADO: Annual show; Grand Junction Gem & Mineral Club, Inc., Grand Junction, Co.; Two Rivers Convention Center, 1st and Main Sts.; Sat. 9:00 am-6:00 pm, Sun. 9:00 am-4:00 pm; Adults \$3.00, Students \$1.00, Children are Free; 68th Annual show with 37 dealers, activities for the children, silent auction, door prizes, displays and demonstrations. Free parking at the convention center and lite breakfast and luncheon food is available. Show Chairman: Chuck Duncan Tele: 970/270-8068 Dealer Chairman: Bambi Harmon Tele. 970/245-1414; contact Chuck Duncan

9-10—RENO, NEVADA: Annual show; Reno Gem and Mineral Society, Reno-Sparks Livestock Event Center; 1350 N. Wells Ave; Fri. 10:00 am-5:00 pm, Sun. 10:00 am-4:00 pm; Adults \$6.00, Seniors \$4.00, Students \$4.00, Children are Free!; Our Golden 50th Year Annual Celebration Gold Panning Educational Displays; contact Steve Norman, 1653 Topeka Circle, Sparks, NV 89434, (775) 358-7322; e-mail: snorm11@hotmail.com; Web site: www.renrockhounds.com

15-17—JOPLIN, MISSOURI: Annual show; Tri-State Gem & Mineral Society, Schifferdecker Park; 504 Schifferdecker Ave.; Fri. 9:00 am-6:00 pm, Sat. 9:00 am-6:00 pm, Sun. 9:00 am-3:00 pm; Admission is free!; Tri-State Gem & Mineral Society's annual outdoor rock swap. Located in historic Schifferdecker Park at the intersection of Joplin's 7th street and Schifferdecker Ave. Admission is free. To reserve space EMAIL jmc-cwiseman@sbcglobal.net; contact Chris Wiseman, (417) 623-1180; e-mail: jmc-cwiseman@sbcglobal.net

15-17—SACRAMENTO, CALIFORNIA: Wholesale and retail show; Gem Faire Inc, Scottish Rite Center; 6151 H St.; Fri. Noon-6 pm, Sat. 10 am-6 pm, Sun. 10 am-5 pm; Admission \$7, Children are Free (ages 0-11); Fine jewelry, precious & semi-precious gemstones, millions of beads, crystals, gold & silver, pearls, minerals & much more at manufacturer's prices. Exhibitors from around the world. Jewelry repair & cleaning while you shop. Free hourly door prizes.; contact Yooy Nelson, (503) 252-8300; e-mail: info@gemfaire.com; Web site: http://www.gemfaire.com

15-17—SOUTH JORDAN, UTAH: Annual show; Wasatch Gem Society, Salt Lake County Equestrian Park and EventsCenter; 2100 West 11400 South; Fri. 10:00 am-6:00 pm, Sat. 10:00 am-6:00 pm, Sun. 10:00 am-5:00 pm; Adults \$2.00, Children under 12

free; Come see thousands of rocks, minerals, and fossils. Lots of great dealers and large selection of club tables for kids and adults! Plus beautiful show cases showing off the wonders of the rock and mineral world!!!; contact Connie Stanton, West Valley, UT 84120, (801) 209-4390; e-mail: connie.inspireddreams@gmail.com; Web site: www.wasatchgemssociety.com

15-17—SANTA ANA, CALIFORNIA: Wholesale and retail show; LLD Productions, Holiday Inn-Orange County Airport; 2726 S Grand Ave.; Fri. 10 am-6 pm, Sat. 10 am-6 pm, Sun. 10 am-5 pm; Admission is Free!; contact Regina Aumente, PO Box 665, Bernalillo, NM 87004, (505) 867-0425; e-mail: mzexpos@gmail.com; Web site: www.mzexpos.com

16-17—MARTINSVILLE, VIRGINIA: Annual show; Treasures Of The Earth Gem & Jewelry Shows, National Guard Armory; 315 Commonwealth Blvd. W., across from Liberty Fair Mall; Sat. 10-6, Sun. 11-5; free admission; beads, pearls, gemstones, gem trees, wire wrapping, wire sculpture, silversmiths and goldsmiths, custom work and repairs while you wait, door prizes, classes available; contact Van Wimmer, Show Director, 5273 Bradshaw Rd., Salem, VA 24112, (540) 384-6047; e-mail: van@toteshows.com; Web site: www.toteshows.com

16-17—LAKEVIEW, OREGON: Annual show; Tall Man Rock Chippers, Lake County Fairgrounds; 1900 N 4th; Sat. 10 am-5 pm, Sun. 10 am-4 pm; free; We have a good variety of vendors, activities for the kids, a silent auction featuring many of the local rocks, good food, club showcases, raffle, and field trips including the Oregon Sunstone. Camping is available onsite. No tailgating.; contact LeRoy Johnson, (541) 947-4267; e-mail: lostmymarblesor@yahoo.com

16-17—NORTH OLMSTED, OHIO: Show and sale; Parma Lapidary Club, Soccer Sportsplex; 31515 Lorain Rd.; Sat. 10:00 am-5:00 pm, Sun. 10:00 am-5:00 pm; Admission \$6.00, Children under 12, and Scouts in uniform Free!; Demonstrations, Kid's Corner, Chinese/Silent Auction, Exhibits Free Parking; contact Martha Lamparyk, 1012 Chippewa Street, Grafton, OH 44044, (440) 926-3680; e-mail: jmlampa@gmail.com

16-17—WAUWATOSA, WISCONSIN: Show and sale; Wisconsin Geological Society, Muellner Building - Hart Park; 72nd and State St.; Sat. 10-5, Sun. 10-5; adults \$3 (two for \$5), children free; more than 20 dealers, exhibits, children's activities, door prizes; contact Paul Schmidt, 8213 Red Arrow Ct., Wauwatosa, WI 53213, (414) 7721-8668; e-mail: pvs@wi.rr.com; Web site: www.wis-geologicalsociety.com

16-17—HAMILTON, MONTANA: Annual show; Bitterroot Gem & Mineral Society, First

continued on page 61

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These Oregon sunstones weigh between 2 grams and 4 grams and range in size from 12 mm to approximately 24 mm wide.

Oregon Sunstone Miner Jim Allen

Story by Rob and Julie Kocur

Sixty-year-old Jim Allen didn't exactly wake up one day wanting a career in the gem industry. Many events conspired to lead him to his present day occupation. Born in Dalton, Georgia, Allen moved nearly 3,000 miles to Shelton, a small town in Washington State. Eight months into retirement, Allen knew he had to do something else with his life. Little did he know he would end up owning an Oregon sunstone mine. We had the pleasure to get to know this fascinating, self-made man.

R&J: Why did you move to Washington?

JA: I met a girl of course! We've been together about 16 years. She had box seats to a Yankee game in Seattle and I was there! Not long after, I packed up my construction business of 32 years and moved to Shelton, Washington.

R&J: What jobs have you had in your lifetime?

JA: Wow! That would take several pages to answer, but I started off in structural steel, and moved into the fabrication shop after the first winter. I've always enjoyed working with my hands. I have worked in and owned auto body shops, hot rod shops, light steel fabrication shops, and general contracting, where I learned to work with non-noble metals: steel, brass, tin and lead.

R&J: How did you get into the gem business?

JA: About 16 years ago, I began having some health problems, mostly involving my back and knees. Consequently, I was forced

to consider other ways to finish my work career. My girlfriend liked jewelry, and I saw it as micro fabrication, so I thought I would try it. The silver and gold work with the torches and saws and little mills were right up my alley. I thought they were cute, and as I had worked the larger equipment in my youth, I knew where to hold the materials, and where not to put my hands. But in the end, it wasn't complete to me.

I had a friend, Merle, who would cut my stones for me, and after watching him do a few, I asked if he would show me how to cut stones. He agreed to show me when his cutting season was finished, as he was the resident cutter at the Dust Devil mines in Oregon. The only condition was that I would have to buy my own faceting machine beforehand. When he returned in late October that year, I had acquired a good machine, and he gave me five lessons to get me started. I still call him for advice when I need it, even though he has long since quit cutting. Today, I find that it takes so long to do faceting, that it's really not profitable for me.



Jim Allen acquired his mining claim in Plush as a sole proprietor when the previous claim holders failed to pay the required annual fee.

R&J: Were there any growing pains in the very beginning?

JA: Shortly after I started cutting professionally, I had a man and his grandson come into my studio and ask me to cut this 80-carat ruby that they had, but it just didn't look right. I called a friend who was cutting and asked him about such a large piece of ruby rough. He told me to have it certified before I took it in. It turned out to be some of the best advice I'd ever gotten, for the stone turned out to be a garnet. Had I taken it in to cut, I could've been on the hook for an 80-carat ruby! I decided that I needed to learn gemstone testing so that this incident would never happen again.

R&J: What is your formal education, if any? How challenging was the training?

JA: My first school of choice was the Fellow of the Gemmological Association of Great Britain (FGA), but it was too expensive for me, so I decided on the Gemological Institute of America (GIA). I started taking the courses and earned my Accredited Jewelry Professional diploma, and felt that I now understood enough about the stones to be able to identify what I was cutting without the worry of being fooled by a garnet.

At the end of the day however, it just wasn't enough. I needed to get out in the field. I did fee digs for sapphires, garnets, opals and sunstones for about six years. I would come home and cut the spoils of my adventures. I was making jewelry and working the shows to sell them during the winter, and longing to get back outside to the mines.

R&J: How did you acquire the sunstone mine in Plush, Oregon?

JA: Last year I got an opportunity to get into mining full-time and acquired a mining claim in Plush as a sole proprietor. Two guys owned the rights to the mine, but they ended up forfeiting their claim because they failed to pay the required annual fee. I took

AMERICAN GEMSTONES MINING CO. PHOTO



The variety of colors in a natural, untreated sunstone makes the gem a great addition to any collection or jewelry box.

over, and American Gemstones Mining Co. was formed. I build and fabricate my own equipment, and I have no partners at this time, but I do have a certified miner contractor, Mike Leyva, who I will go forward with next year as I expand my claim to 42 acres. We'll work both claims as partners.

R&J: What is the mine's name?

JA: Misha 2. Misha is the name of an Indian princess, I believe from the local Klamath tribe. All of the area is old reservation land. We have to be very careful not to unearth Indian artifacts. If we do, we have to notify the Bureau of Indian Affairs.

R&J: What challenges have you encountered? Any surprises?

JA: The biggest challenge was the amount of red tape I had to cut through in order to officially open the mine. I definitely needed an attorney. One example of how ridiculous it is: The Feds wanted proof that the certified check I wrote them from my bank account, actually came from me! It delayed the whole process by about three weeks.

People have a tendency to think that all a person has to do is put a shovel in the ground and you get the stones. It's much more complicated than that. You have to actually break up the rock and get under it to gain access to the more valuable gems. The entire undertaking is definitely more expensive than I ever thought. For example, I had to buy a huge water trammel, which filters out the dirt in order to make it easier to find gems. There are challenges regarding safety. You have to be on the lookout for claim jumpers and banditos who are looking to steal what you have. I have dogs at the camp and I won't hesitate to release them if I feel the need. Then there're the trigger-happy rabbit hunters. On more than one occasion, there have been bullets fired at the camp.

R&J: What are you doing to prepare the mine for its opening?



AMERICAN GEMSTONES MINING CO. PHOTO



JA: Right now with the new start of the Mine Safety and Health Administration (MSHA) in the area, we are not having fee digs. This is a very expensive venture with just the insurance alone. To have visitors in the mining areas, we have to shut down production for safety reasons ... days lost are just not feasible.

R&J: When do you think it will be open to the public?

JA: I hope that, starting in 2015, it will be open for two months out of the year: June and either September or October. Keep an eye on my Facebook page, American Gemstones Mining Co., for updates.

R&J: How much will it cost for someone to come to the mine?

JA: The public will be charged by the day. They can mine if they want. I'd also like to add that the Oregon Sunstone Miners Trade Association, chaired by Don Buford, owner of the Dust Devil mine, is a big and exciting part of our future plans. It's a group of active mines that want to be able to maintain the integrity of Oregon sunstones. We are striving to get the Made in America stamp of approval. We want our customers to know that this seal means that they can rest assured that the gems are 100% natural and untreated. We also want to use disabled veterans to make the jewelry.

R&J: Who are some of your mentors in the industry? Who do you admire the most?

JA: That's a hard question to answer. I have so many. All the fellow miners have been more than helpful with advice, equipment, paperwork, and more. They all give encouragement, and it's nice to know that they are watching us to make sure that nothing drastic happens. The ones that I really admire are the ones behind the scenes that work so hard to make the operations successful: Terry Clark, Mike Leyva, Jake Linder, and David Grey, to name a few. It doesn't matter how full their plate is, they will stop in mid-stream to help. I have to say that these are the people that I really admire.

R&J: What is your favorite gem?

JA: Well, to be honest, I've never met a gemstone I didn't like. I'd have to say sunstones from Oregon. The content of copper really sends the fire through the roof. In the right setting, it's hard to beat. With the variety of colors in a 100% natural, untreated gemstone, sunstone makes a great addition to any collection or jewelry box. Since they're an American gemstone, it makes me proud to show them, find them, and wear them.

R&J: What is your favorite gem to cut?



ROB AND JULIE KOCUR PHOTO

Terry Clark and Mike Leyva are two of the people who work so hard behind the scenes to make the operations successful.

JA: It would have to be sapphires. I particularly like the Kenyan sapphires. They're 10 times cleaner than the ones from Montana.

R&J: Of the ones you've cut, are there any you're particularly proud of?

JA: A 6.5 color sapphire. It changes from purple to blue to yellow.

R&J: Since signing onto Facebook, I consider you to be one of my mentors, as I am learning the gem industry. You help me to understand what to look for when purchasing a gemstone. How does that make you feel knowing that you have affected me—and, I am sure, others—that way?

JA: Please don't put me on a pedestal. I'm just a regular guy who was lucky enough to have been born in the greatest country in the world, where a person can truly apply themselves and be as successful as they want to be. There is always a way to succeed in America if you're willing to put forth the effort. 💎

Interstate Center ; 100 Old Corvallis Road , Ravalli County Fairgrounds; Sat. 10 am-6 pm, Sun. 10 am -4 pm; Admission is Free; May 16 & 17 The Bitterroot Gem & Mineral Society presents its annual "Treasures from the Universe" in the First Interstate Center on the Ravalli County Fairgrounds in Hamilton Montana. Free Admission! Enjoy displays, kids activities, dealers, world class mineral specimens, fossils, jewelry, UV display, silent auction, dealers, beads, hands on rock ID, rock equipment, door prizes, Dinosaur display and presentations from the Two Medicine Dinosaur Center. Pancake and sausage breakfast both mornings 8 a.m. to 10 a.m.; contact Mike McConnell , 114 North 5th Street , Hamilton, MT 59840, (406) 360-4944; e-mail: micker1949@yahoo.com; Web site: www.bitterrootgms.org

16-17—MAYS LANDING, NEW JERSEY: Annual show; Cape-Atlantic Rockhounds, Mays Landing ; 2641 Cologne Ave; Sat. 9:00 am-5:00 pm, Sun. 9:00 am-5:00 pm; Admission is Free; Annual Spring Rock, Gem, Mineral, Jewelry, and Fossil Show. This show will be held rain or shine. Food is available onsite.; contact Billie Brockhum, (609) 879-1179; Web site: http://capeatlanticrockhounds.com/

16-17—LEESPORT, PENNSYLVANIA: Annual show; Berks Mineralogical Society, Leesport Farmer's Market Banquet Hall; 312 Gernant's Church Rd; Sat. 10:00 am-5:00 pm, Sun. 10:00 am-4:00 pm; Adults \$3.00; contact James Woodeshick, (484) 338-6738; e-mail: brwoodpile@yahoo.com

16-17—PINETOP, ARIZONA: Show and sale; White Mountain Gem & Mineral Club, Hon-Dah Conference Center; 777 Highway 260; Sat. 9:00 am-6:00 pm, Sun. 10:00 am-4:00 pm; Adults \$2.00, Seniors 70+ Free, Students 18 and under Free, Children 18 and under Free; Member Displays, Raffles, Door Prizes, Silent Auction, Children Activities, Dealers, Fluorescents, Dinosaur Exhibit and Demonstrations.; contact Rick Olson, 8276 Tahoe Pl, Show Low, AZ 85901, (928) 251-0949; e-mail: walkaround@earthlink.net; Web site: whitemountain-azrockclub.org

16-17— SEATTLE, WASHINGTON: Annual show; Seattle Mineral Market, Lake City Community Center; 12531 28th Ave NE, 11705 206th Pl SE; Sat. 10:00 am-6:00 pm, Sun. 10:00 am-5:00 pm; Admission is Free; FREE ADMISSION~FREE PARKING~FREE MINERALS FOR KIDS Mineral specimens, gem minerals, mineral and mining books, mineral art, and mineral photography. There is a free underground parking area in the library next door, but it closes at 5 PM.; contact Bart Cannon, 1041 NE 100th Street, Seattle, WA 98125, (206) 522-9233; e-mail: cannonmp@comcast.net; Web site: http://www.seattlemineralmarket.com/

16-17—HERMISTON, OREGON: Annual Gem and Mineral Show ;

Hatrockhounds Gem and Mineral Society - Hermiston OR, Hermiston Conference Center; Highway 395 South; Sat. 10 am-5 pm, Sun. 10 am-4 pm; Adults \$2.00; contact Mike Filarski, (541) 571-2593; e-mail: stonemorlin1@netscape.net

16-17—HAMILTON, MONTANA: Annual show; Bitterroot Gem and Mineral Society, Ravalli County Fairgrounds; 100 Old Corvallis Road; Sat. 10 am-6 pm, Sun. 10 am-5 pm; Admission is Free; contact Steve Vieth, (406) 381-7597; e-mail: viethsteve88@gmail.com

22-24—SALEM, VIRGINIA: Annual show; Treasures Of The Earth Gem & Jewelry Shows, Salem Civic Center; 1001 Boulevard; Fri. 10-6, Sat. 10-6, Sun. 11-5; \$5 (3-day pass), children (under 16) free; beads, pearls, gemstones, gem trees, wire wrapping, wire sculpture, silversmiths and goldsmiths, custom work and repairs while you wait, door prizes, classes available; contact Van Wimmer, Show Director, 5273 Bradshaw Rd., Salem, VA 24153, (540) 384-6047; e-mail: van@toteshow.com; Web site: www.toteshow.com

22-24—SANTA BARBARA, CALIFORNIA: Wholesale and retail show; Gem Faire Inc, Earl Warren Showgrounds; 3400 Calle Real; Fri. Noon-6pm, Sat. 10am-6pm, Sun. 10am-5pm; Admission = \$7, Children Free (ages 0-11); Fine jewelry, precious & semi-precious gemstones, millions of beads, crystals, gold & silver, pearls, minerals & much more at manufacturer's prices. Exhibitors from around the world. Jewelry repair & cleaning while you shop. Free hourly door prizes.; contact Yooy Nelson, (503) 252-8300; e-mail: info@gemfaire.com; Web site: http://www.gemfaire.com

22-24—BILOXI, MISSISSIPPI: Annual show; Harrison County Gem and Mineral Society, Inc., MS Coast Coliseum and Convention Center; 2350 Beach Blvd.; Fri. 10 am-6 pm, Sat. 10 am-6 pm, Sun. 10 am-4 pm; Adults \$5, Children under 10 free; Free Parking; contact Lynn Tate, Harrison County Gem and Mineral Society, Inc., P.O. Box 10136, Gulfport, MS 39505, (228) 342-2963; e-mail: GulfportGemShow@gmail.com

22-24—SAN ANTONIO, TEXAS: Annual show; Exhibit Group International, Embassy Suite Hotel Ball Room; 7750 Briaridge Drive; Fri. 11:00 am-6:00 pm, Sat. 10:00 am-6:00 pm, Sun. 10:00 am-5:00 pm; Adults \$3.00, Children are Free; Fine Jewelry gold and diamond, fine jade selection, large choice of gem, beads and mineral stone, finding & petwer supplies, beading class, fashion jewe lry and gift more.; contact john su, 13337 South Street #633, cerritos, CA 90703, (714) 494-4546; e-mail: egi168@hotmail.com; Web site: www.egishows.com

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POTRY PAGES

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I Am A Rock

When I was born I do not know;
It was a long, long time ago.
I do recall my place of birth;
It was deep, deep within the earth.

One day I rose, getting cooler and cooler,
And soon I felt getting harder and harder.
I looked all around at me: "I am a rock!"

And there I stayed, for a long, long time.

Then rose again, with my neighbors.
They went away; I was alone.
They became sand; I stayed stone.

Now I could look up and see the sky.
Now I could look out and see the sea.
Oh, how beautiful it was to me.

And there I stayed, for a long, long time.

The summers, though, they were all so hard on me.
The sun, the wind, the rain, they all beat on me.
I looked around, and saw less and less of me!

Winters were worse; that could be.
Water filled my cracks, then froze.
Tumbling down went parts of me.



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Boulders of me turned into cobbles;
Cobbles into pebbles, sand, and silt.
Is this still me?

Then pressure came.
My pebbles pushed into the mud.
My sand cemented, my silt squished.
What's to become of me?

I waited until I could wait no more.
I felt all around me just to be sure,
And again I could say: "I am a rock!"

And there I stayed, for a long, long time.

Then pressure came,
More than before.
Thought what Nature
Might have in store.

Parts of me twisted into shapes grotesque.
Parts flattened into sheets so thin
I could be split with a putty knife!

I waited until I could wait no more.
I felt all around me just to be sure,
And again I could say: "I am a rock!"

And there I stayed, for a long, long time.

Then I fell, getting warmer and warmer.
What's happening to me?
Then I remembered what happened before—
I know what is to be.

So I waited for the day that I knew must come,
And again I rose, getting cooler and cooler,
And again I felt getting harder and harder,
And again I looked at me: "I am a rock!"

—Richard Andrew Kowaleski © 2014



The Miner

All miners live with dust and grime
That stays with them most of the time.
Because they mostly can be found
In tunnels deep beneath the ground.

They're kept from sunshine and clean air,
And are confined, which isn't fair.
But that's the job they're paid to do
And you may find it interests you,
When the first time you get to find
That crystals can astound your mind
By beauty and by their luster
And clarity with nice color.

All Rockhounds like to chip away
And find nice crystals every day.
But crystals can be hard to find.
And breaking rock can be a grind.
There's hazards, too, for each miner,
And all of them they can occur.
There's cave-in, black lung, explosion
Bad air and work Herculean;

Rock falls and claustrophobia.
No job is a panacea.
There's heat exhaustion, fire, and flood,
And steamy heat and also mud.

All miners risk their life and limb
Their work is hard and may seem grim.
But they have their compensation
For they see beauty and have fun.

They uncover what no one's seen,
And discover new and pristine.
What they do mine they save or sell.
It's worth it all, they serve us well.

—Ronald J. Yadusky,
BS, MD, FACS

A Crystal

There was a time when I would see, a part of nature's geometry,
I'd sit and stare, without a thought, of how the light reflected off,
But little did I know back then, of the complexities held within,
The minerals that I would hold, their tales as precious as pure gold.

The first was quartz, oh what a joy, silicon and oxygen, does not annoy,
Six sided with a point on high, hexagonal, and that is why,
This crystal looked so cool to me, doubly terminated gave more to see,
Though sceptered seemed the best of all, a kingly sight in any hall.

The next was beryl, six more sides, green ice cubes for eyes to ride,
Beryllium an important part, combining with an aluminum heart,
With oxygen and silicon too, a little chromium to finish the queue,
A flattened point, unlike quartz, did not seem to cut it short.

Then calcite came upon my midst, a gem much bigger than my fist,
Dog toothed, they called it to my amaze, it firmly held onto my gaze,
Calcium and carbon, with oxygen here, honey colored from an organic smear,
Scalehedron was the real name, a doubly terminated masterpiece in which to frame.

But many colors came to me, with a cubic mineral that I could see,
Its name fluorite, and what a rock, pinks, greens and blues make quite a flock,
Calcium returns to the scene, with the element that we call fluorine,
Cubes seem to be its major shape, but the octahedral form makes me agape.

But with the fluorite that I have found, another cube from out of the ground,
This more hard, and shiny too, a lot more heavy with a silver hue,
Lead it seems, has taken hold, of sulfur to make this rock of old,
Galena, the name that it now bears, spinel law is my favorite pair.

Then there is copper known to all, it makes such beautiful minerals,
Azurite, a nice deep blue, comes in many forms to view,
From cubes to points that look like spears, this carbonate will hold back tears,
Though over time, change it might, to its greener cousin, malachite.

Rarely crystalline, this copper rock, forms botryoidal shapes that seem to lock,
Bands of dark and lighter greens, sometimes polished to a brighter sheen,
But prized the most are cubes and spines, radiating out that look so fine,
And sometimes you will see a sight, a pseudomorph of azurite.

Nature has a wonderful way, to make beautiful shapes that seem to say,
That hidden deep within its depths, are sights that would just stop your breath.
To gaze upon such awesome sights, elevates you to greater heights,
So as I conclude this little poem, I look contently at my display at home.

—John Green



FIRST TIME LUCKY



The Lawrence County Rock Show, held in Bloomington, Indiana, is a wonderful Midwestern show at which a budding dealer can get used to the ropes.

Student Mineral Dealers Enjoy Immediate Success

Story and photos by Mark Leatherman

I've been attending mineral shows since I was in elementary school, and have always wanted to try my hand at traveling regionally on key weekends as a specimen dealer. Since I was pursuing a graduate degree in geology, I thought that I would have to wait some time before getting on my feet professionally: go on some collecting trips, sort everything, come up with a memorable seller name, and then partake in a show. Little did I know that, when I was 26 years old, some friends and I would get a chance to become mineral dealers without accomplishing said checklist.

After completing my master's at the University of Missouri, I reflected on the fact that I wish I could have been a more active student, rather than focus 100% on bookwork. When I started my first semester of doctoral studies at Indiana University–Bloomington (IU), I decided to change that. Fellow graduate student Eric Stifter and I created a student chapter for the Society of Economic Geologists (SEG).

As a brand-new student organization, of course, we had to raise funds in order to do anything. Then, without even thinking of it, I came across a flier in the Indiana Geological Survey (the department and survey are attached) for the annual Lawrence County Rock, Gem and Fossil Show, to be held in three months' time (June) right in Bloomington! We wouldn't have to worry about expenditures for gas, eating out, or lodging. As long as we could convince members of our group to donate some specimens for sale, we would be cooking with gas in hosting our very own booth at a rock show! When the idea was presented at a chapter meeting, everybody seemed to be on board and preparations began.

I started to look over the more than 200 specimens in my personal collection to see which ones I could part with. I had a wide assortment of specimens of varying species, quality and sizes. Some other members brought in specimens collected in their field classes—pyrite, kyanite blades, garnet from North Carolina, sillimanite

The Society of Economic Geologists Student Chapter @ Indiana University

Established March 2012



We didn't have large, professional banners like some dealers, but our 8.5- by 11-inch fliers managed to attract positive attention.

and clevelandite from New England, Michigan native copper, Arkansas quartz, southeast Missouri barite, fluorite from Illinois-Kentucky—and even some thumbnail tourmaline and assorted other gemmy crystals bought from past shows. We were also fortunate enough to have a faculty member donate two pieces of Arizona gold in quartz from an old collection.

Additionally, I was slated to travel to Upper Michigan on a research trip a month before the show. I made certain that, if I had a break, I would nab some specular hematite for our booth. As a finishing touch to what we would offer, my wife was gracious enough to donate some wire-wrapped, polished-stone jewelry she had made as a teenager.

The big weekend of the Lawrence County show finally arrived! We had everything we needed: specimens, printed signs, an official SEG banner, tables, and a velvet tablecloth, on loan from our department. My friend Allen Quaderer helped me load and transport everything to the Monroe County Fairgrounds with his van, affectionately called “the boat”. When we started carrying totes of our supplies to our reserved space, however, my initial excitement came to a halt.

I looked around at all the other professional dealers, including a couple that were hauling large, world-class quartz crystal and fluorite cube clusters. It also did not help that among the first tables set up were polished-mahogany display cases with interior lighting. I paused for a second and looked down at my tote, then I looked over at Allen and said, “How the hell is anyone going to notice us kids? We have a smaller, lower-quality, hodge-podge set of specimens amassed by students that are mostly poor, and look at these guys!”

If we could make \$100, that would still positively contribute toward any chapter activities; \$200 and I would personally be very happy! We were establishing our nest when a geologist friend of ours, Dr. Nelson Shaffer, of the Indiana Geological Survey, came across us and wished us luck on our endeavor to be. Dan Fether-

ston, Josh Field, Eric Stifter, Aga Furmann, and Alyssa Ruthkay also volunteered in this endeavor.

The first of our three days seemed to get off to a quicker start than I’d expected. The first few attendees passed by our table with dispassionate looks. Then we made our first sale as mineral dealers to a gentleman around our age: an eight-piece set of 1-inch-square gold-silver telluride min-

erals for \$40 that I purchased a couple years back. The second item we sold, almost immediately afterward, was quite expected: the pair of Arizona gold ore pieces for \$80.

After that, traffic slowed down somewhat for the rest of the day, but we raked in \$175. Hitting the high end of my personal goal in one day definitely brought smiles to Allen’s face and mine, and those who were slated to run our table on Saturday came in with an invigorated energy.

The second day started a lot quicker than the previous one, with some starting interest in the wire-wrapped jewelry. It was agreed upon by the volunteering chapter members that we could haggle on prices, given our outstanding first day and the fact that our end goal was not purely to make a profit or “break even”. As the day went on, I expected more traffic due to it being a Saturday, but for what we had to offer, I never expected the levels of traffic we were about to experience.

After a very busy late morning and early afternoon, an older gentleman working the booth directly to our right walked over and introduced himself to us as Tom, of The Mineral House, based in Bucyrus, Ohio. He was curious about what our group was and what young people like us were doing in mineral dealing. I warmly told him about how we are holding a fundraiser for future chapter activities such as campouts, inviting guest speakers, and field trips.

When there was a break in the action, he invited us to step into his booth to show off his flats. My eyes grew wide as they took in flats of celestite and rootbeer fluorite from northwest Ohio, not only because they were attractive specimens, but because I am an



▲ The funds raised from our first mineral-dealing venture greatly supported educational field trips for chapter members, such as visits to active mines in Montana.

◀ Members of the SEG-IU donated a wide array of their personal specimens and jewelry to sell at the show.

Ohio native who had not procured either specimen type at the time. My wife had come to our booth not long beforehand to hang out and manage any jewelry sales, and she immediately wanted to purchase one of his fluorite specimens.

It was then that he handed us three of his celestite clusters. At first, I thought he was offering us a couple of his best pieces to choose one to buy. When we attempted to hand them back, however, he said for us to keep them! He explained that what we were doing was very admirable, and he wanted to help in some way. He said that we could keep all that we sold these specimens for: no consignment, nothing! To say I was quite surprised would be a huge understatement. After being briefly flabbergasted, I was able to muster up a huge thank you. He replied that folks like him do not have many years left, and that we young people are the future of the hobby. This interaction became the shining light of our first experience here, not surpassing some arbitrary number!

Later on in the afternoon, Dr. Shaffer came back around our table and asked how we were doing. I summarized our higher-than-expected sales and the celestite donation, and he said he was glad he could help. When I looked at him, puzzled, he explained that he had sent nearly everyone he interacted with while walking around our way. He got the word around about our presence as university students, our mission, and how we were not conventional sellers, and people seemed to want to come to us. (It probably also helped that he was running for a local political office and had done some politicking!) Like Tom, he thinks investing in young people in the rockhounding hobby is well worthwhile. To cap off the day with a cherry, an elementary schoolteacher left us her contact information and asked if we could do an earth science outreach event in the future!

The third day, Sunday, was slower, as time at the show was winding down. Our sales were scattered throughout the day, with more haggling going on than on the previous two days. I can remember that our last sale was a small, opaque emerald with some biotite that a younger buyer had been eyeing the previous day.

As Allen and I wrapped up shop around 4 p.m., he started to load materials back into bins while I counted up the monetary result of the weekend.

"Hey, dude," I said, "remember when I said \$100 to \$200 would make me happy?" He nodded. I replied, "Try just shy of \$500!" He was definitely just as shocked as I was, and we both deemed our first venture into mineral dealing a relative success.

Our sudden first venture into mineral dealing was definitely a fun ride. While meeting our modest goals, we learned of ways in which we could improve. The most



In southern Indiana, sedimentary geodes, which can host a wide array of minerals and crystal habits, are a main attraction at rock shows.



Kind donations, such as these clusters of celestite (left) and rootbeer fluorite (right) from northwest Ohio, from more established dealers greatly contributed to a delightful selling debut.

noticeable thing, in my opinion, was that we tried to sell anhedral ore specimens by the pound. When we only sold one mixed iron ore specimen from southeast Missouri all weekend, Allen quickly agreed with me that we should price them according to size ranges the next time.

The next improvement would be to have jewelry stands to display my wife's products. Since the idea to sell these came rather late, we didn't have the time to drive two states away and retrieve her collection of stands, stored at her parents' house. This was more of a minor setback; unlike the ore, we sold a noticeable number of jewelry pieces.

Before the start of the show, I had wondered if the seven volunteers who signed up would be enough to keep the stand going for all three days. Thankfully, we succeeded on that front, especially since we only had one undergraduate student (since most have gone home for the summer), and we graduate students could have easily wrapped up more of our weekend time in research.

Even though we sold the bulk of our inventory, we were left with a nice handful

of unsold specimens to build upon for the next time. If we had sold more, we might actually have had a harder time preparing for the following year's show, for two reasons: 1) there would be no guarantee that we could piecemeal as large of an inventory the next time from future new members, and 2) since the bulk of chapter members go on the same limited number of field trips annually, the specimens collected from these ventures would not be as diverse. As a buyer, I am more intrigued by a mineral dealer who offers a wide variety of specimens for sale.

I truly believe that the surprising success that went with our first venture into mineral dealing was largely based on two factors: 1) being innovative in that we were not just another dealing hoping for profit or breaking even, and 2) the cooperative spirit of the rockhounding community present. Without the help of Dr. Shaffer, and undoubtedly others, in spreading the word of our presence, we would definitely not have done as well. Who knows, perhaps a dealer's table at Denver and/or Tucson could someday be in the cards! 💎



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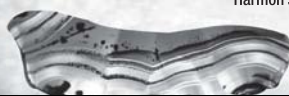
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Loony's, 16 W. Sheridan, Ely, MN 55731; HYPERLINK "mailto:elyrockshop@yahoo.com" elyrockshop@yahoo.com; 775-781-2047 DI15

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PICKS & PANS

News and Reviews

The World of Tourmaline: The Gerhard Wagner Collection

Editors: Mary Fong Walker, Gunther Neumeier, Jim Walker

This remarkable private collection of tourmaline was assembled over about 25 years as locality after locality was mined for specimens. It represents just about every tourmaline source that has produced specimens of note during those 25 years.

Federico Pezzotta, Daniel Trinchillo, Gerhard Wagner, Jim Walker, and Mary Fong Walker contributed text to the 264-page hardcover book, and the more than 370 color photos are by Mark Mauthner.

What I like about this text, aside from the superb photographs, is that it is bilingual, with side-by-side columns of English and German text.

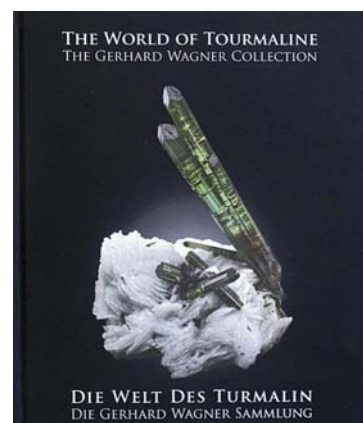
Wagner describes how his interest in minerals began, then grew as he became more and more enamored of the beauty of minerals. His interest and efforts to collect superb tourmalines emerged from that, and he describes how he slowly moved from being a general collector of minerals from all over the world to specializing in just one species. This strategy change has brought together hundreds of fine examples of this gem species in a remarkable collection that is now beautifully exhibited in this text.

The crystals range from single gem shafts that are superb and well terminated to matrix specimens of great variety and excellent quality. Some crystals are just a few centimeters long, while some others exceed 25 cm. The crystal position and arrangement is random, but aesthetic in some, while other specimens look almost haphazard in form and positioning.

I find it quite remarkable that, once Gerhard developed this fine collection, he submitted it to Heritage Auctions in Dallas to be auctioned off June 7. I fully intend to watch that auction on my computer on the Heritage Auction site, www.ha.com. It should be a most remarkable event, just as the book is a most remarkable presentation of tourmaline. The book is published by Ivy Press, and can be purchased from BlueCap Productions.

—Bob Jones

\$50 (<http://shop.bluecapproductions.com/>)



Volunteer at the Peabody Museum

Rockhounds and fossil enthusiasts in the New Haven, Connecticut, area can promote their hobby by volunteering their time at the Peabody Museum of Natural History, Yale University. Volunteer opportunities include helping families—especially children ages 5 to 12—explore the museum's collections in The Discovery Room, operating the Fossil Cart, assisting in a variety of research and support activities, leading programs for visitors from school age to seniors as a Museum Docent, working with museum preparators to create and maintain exhibits, and helping with the Rocks and Minerals segment of the Peabody On The Road program.

Openings are available during the week or on weekends, working with the public or behind the scenes. For more information and an application form, visit <http://peabody.yale.edu/volunteer>.



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Show Dates from page 61

22-25—SCOTTSBLUFF, NEBRASKA:

Annual show; Panhandle rock & gem cub, Riverside Zoo campground; 1600 S. Beltline Hwy W.; Daily 8 am-5 pm, Daily 8 am-5 pm, Daily 8 am-5 pm, Daily 8 am-5 pm; Admission is FREE!; Free admission - Public Welcome - Public also invited to attend the rock auction Saturday evening starting at 6:30 pm. Any scout in uniform will receive a free gift. Families with children are welcome and encouraged to attend.; contact Richard Benker, 1730 M. St., Gering, NE 69341, (308) 436-4697; e-mail: rekneb@charter.net

23-24—BENNINGTON, VERMONT:

Annual show; BCA Minerals, Grace Christian School; Kocher Dr.; Sat. 10 am-5 pm, Sun. 10 am-4 pm; Adults \$5, Children Free; Southern Vermont Mineral, Gem and Fossil Show at Grace Christian School, 104 Kocher Dr., Bennington, VT. May 23rd and 24th, 2015. Saturday 10am to 5pm, Sunday, 10am to 4pm. Adults \$5., Children Free. Contact info or vendor form: Bill Cotrofeld, BCA Minerals, PO Box 235, East Arlington, VT. 05252 802-375-6782.; contact Bill Cotrofeld, PO Box 235, East Arlington, VT 05252, (802) 375-6782

23-24—SEDONA, ARIZONA:

Annual show; CKM Productions, LLC, Sedona Red Rock High School; 995 Upper Red Rock Loop Road; Sat. 10:00 am-5:00 pm, Sun. 10:00 am-4:00 pm; Adults \$3.00; Vendors from around the region will be offering mineral specimens, crystals, gemstones, jewelry, findings, beads, fossils, cutting material and lapidary equipment. An hourly raffle will be held for a chance to win one of many amazing prizes to be offered throughout the show. Food will be available for purchase during the show as well. This is a unique event the entire family will enjoy. ; contact Greg Capatch, (928) 554-4615

23-24—WHEATON, ILLINOIS:

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continued on page 74

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geode cracking, jewelry making, opal cutting, metalsmithing, glass fusing, wire-wrapping, fossil preparation, cabochon making, faceting, and more. Air-conditioned. Food available. Camping. Free parking. ; contact Jeanine N. Mielecki, (312) 623-1554; e-mail: jaynine9@aol.com; Web site: www.chicagolandgemshow.org

29-31—TULSA, OKLAHOMA: Wholesale and retail show; Gem Faire Inc, Expo Square; 4145 E 21st St.; Fri. Noon-6pm, Sat. 10am-6pm, Sun. 10am-5pm; Admission is \$7, Children are Free (ages 0-11); Fine jewelry, precious & semi-precious gemstones, millions of beads, crystals, gold & silver, pearls, minerals & much more at manufacturer's prices. Exhibitors from around the world. Jewelry repair & cleaning while you shop. Free hourly door prizes.; contact Yooy Nelson, (503) 252-8300; e-mail: info@gemfaire.com; Web site: http://www.gemfaire.com

29-31—WAUSEON, OHIO: Annual show; State Line Gem & Mineral Society, Fulton County Fairgrounds, Junior Fair Building; 8514 SR 108; Fri. 12:00 pm-7:00 pm, Sat. 10:00 am-7:00 pm, Sun. 11:00 am-4:00 pm; Adults \$3.00, Seniors \$2.00, Children under 12 free; contact Doris Brzezicki, 419 N Broad St, Adrian, MI 49221, (517) 263-1669; e-mail: rycharad@tc3net.com; Web site: statelinegms.com

30-30—BALTIMORE, , MARYLAND: Annual show; Chesapeake Gem & Mineral Society, Ruhl Armory; 1035 York Road, Towson MD; Sat. 10 am-4 pm; Admission is Free!; 26th Annual Chesapeake Gem & Mineral Show Free Admission & plenty of free parking Top Mineral Dealers, Original Jewelry, Silent Auctions, Door Prizes, Kids Area, with Kids give-aways. ; contact jim kostka, 906 North St NE, Leesburg, VA 20176, (202) 207-5437; Web site: http://www.chesapeakegemandmineral.org/club-show.html

June 2015

5-7—CLOVERDALE, CALIFORNIA: Wholesale and retail show; Jennifer Macias, Cloverdale Historical Society; 215 N. Cloverdale Blvd.; Fri. 10 am-6 pm, Sat. 10 am-4 pm, Sun. 10 am-4 pm; Admission is Free!; Gems, Minerals, Beads, Jewelry, Rough and Cabbed Turquoise, Native American Jewelry, Crystals, Grab Bags, Fossils and More! Free Admission For more information e-mail Jennifer Macias at Karmicbeadsandgems@yahoo.com ; contact Jennifer Macias, 1839 Ryan Court, Prescott, AZ 86301, (619) 261-8765; e-mail: karmicbeadsandgems@yahoo.com

5-7—COLORADO SPRINGS, COLORADO: Annual show; Colorado Springs Mineralogical Society, Western Museum of Mining and Industry; 225 Northgate Blvd; Fri. 9:00 am-5:00 pm, Sat. 9:00 am-5:00 pm, Sun. 9:00 am-4:00 pm;

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Adults, Seniors + Students \$5.00, Children are free; Admission to the Pikes Peak Gem and Mineral show also includes admission to the Museum of Mining and Industry. At the museum you will not only get to go to a Gem and Mineral show but you will get to learn to pan gold, see a working 1928 Osgood steam shovel and stamp mill and see live donkeys. We have an awesome Kids area and plenty of food and fun for the whole family. This year we are showcasing Topaz, with folks from the show Prospectors showing and selling their Topaz. We will also have lectures on Topaz.; contact Kim Packhm, 87 Plum Creek Rd., Divide, CO 80814, (719) 360-9665; e-mail: runninboar@hotmail.com; Web site: www.csms.us

5-7—BONNEY LAKE, WASHINGTON:

Annual show; Puyallup Valley Gem & Mineral Club, Swiss Park; 9205 198th Ave. E.; Fri. 10-5, Sat. 10-5, Sun. 10-5; free admission; contact Nancy LeMay, PVGMC % Club Show, PO Box 134, Puyallup, WA 98371, (253) 952-6216; e-mail: bees2knees@att.net; Web site: www.puyallupgemclub.org

5-7—OCEAN CITY, MARYLAND:

Retail show; Treasures of the Earth, Inc., Roland E Powell Convention Center; 4001 Coastal Highway; Fri. 12 noon-6 pm, Sat. 10 am-5 pm, Sun. 10 am-4 pm; Adults \$5.00, Military Free with ID, Children 16 and under Free; Vendors from across the US bring their merchandise to you. You will find • 14K and sterling silver, classic, estate, fashion and handmade jewelry • Loose stones, beads and findings, pearls • Mineral specimens, crystals, lapidary supplies • Books, carvings and gift items ; contact Jane Westbrook, PO Box 59, Gloucester Point, VA 23062, (804) 285-4281; e-mail: jane@treasuresoftheearth.com; Web site: www.treasuresoftheearth.com

5-7—FLAGSTAFF, ARIZONA: Annual show; Coconino Lapidary Club, Outdoor Market At Silver Saddle; 9001 N Hwy 89; Fri. 9 am-4 pm, Sat. 9 am-4 pm, Sun. 9 am-4 pm; Admission is Free!; Coconino Lapidary Club will be having their 3rd Annual Show. Gems, minerals, fossils, lapidary equipment, jewelry and findings, slabs, rough, plus gold prospecting equipment and displays will be available from the vendors. The club sponsors an Education Corner where they have activities for kids, a magnificent fluorescent display, a make a fossil area and a rock hunt for kids. Mineral identification. We also sponsor a raffle drawing. This is a Free Admission outdoor event.; contact Wayne Scott, (928) 607-3185; e-mail: 4nsgsrocks@gmail.com; Web site: <https://www.facebook.com/groups/122043251214208/>

6-6—DELTA, COLORADO: Annual show; Delta County Rock Wranglers Club, Heddles Recreation Center; 530 Gunnison River Drive; Sat. 9:00 am-5:00 pm; Free Admission; Delta County Rock Wranglers

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"Annual Rock, Gem & Mineral Show", Saturday, June 6, 2015, 9:00 to 5:00 at the Heddles Recreation Center, 530 Gunnison River Drive, Delta, CO. Free admission, lots of dealers, exhibits, door prizes, and family activities.; contact Harry Masinton, 24662 Sorrento Lane, Cedaredge, CO 81413, (970) 856-3861; e-mail: masinton@tds.net

6-6—MACUNGIE, PENNSYLVANIA:

Annual show; PA Earth Science Assn, Macungie Memorial Park; Macungie Memorial Park; Sat. 8:30 am-3:00 pm; Adults \$5.00; contact Vincent or Janell Olsovsky, 531 Mickley Rd., Whitehall, PA 18052; Web site: mineralfest@verizon.net

6-7—COEUR D'ALENE, IDAHO:

Annual show; North Idaho Mineral Club, Kootenai County Fairgrounds; 4056 North Government Way; Sat. 9 am-5 pm, Sun. 10 am-4 pm; Adults \$3, Children 12 and under Free with adult; contact Bev Bockman, (208) 773-5384; e-mail: bockbb@aol.com

6-7—NEWPORT, OREGON:

52nd annual show; Oregon Coast Agate Club, National Guard Armory; 541 SW Coast Hwy, Hwy 101; Sat. 10 am-6 pm, Sun. 10 am-4:30 pm; Adults \$2.00, Children 12 and under Free; Service Personnel in uniform Free admission Facebook: Oregon Coast Agate Club; contact George Mazeika, PO Box 293, Newport, OR 97365, (541) 991-0311; Web site: www.coastagates.org

6-7—GLEN DORA, CALIFORNIA:

Annual show; Glendora GEMS, Glendora, CA; 859 E. Sierra Madre; Sat. 10 am-5 pm, Sun. 10 am-4 pm; Admission is Free!; dealers, displays, demonstrations, food, silent auction; contact Bonnie Bidwell, 1010 E. Mountain View, Glendora, CA 91741, (626) 963-4638; e-mail: Ybidwell2@aol.com

6-7—SPRINGFIELD, MISSOURI:

Annual show; Hosted by OZARK MOUNTAIN GEM & MINERAL SOCIETY, Outdoors at Missouri Institute of Natural Science; 2327 W Farm Road #190, (Near Rivercut Golf Course); Sat. 10:00 am-5:30 pm, Sun. 10:00 am-4:00 pm; FREE, FREE, FREE, FREE; ROCK SWAP & GEM FAIR; Rocks, Fossils, Minerals, Rough, Slabs, Cabs, Finished Stones, Handcrafted Jewelry, Gold Panning demonstration/practice (fools gold & other), AUCTION (Open to Public) Sat 5:30; Dealers contact OMGMS Attn: Larry Lillich, PO Box 35, 2131 W Republic Road, Springfield, Missouri 65807; Check us out on FACEBOOK: "Ozark Mountain Gem & Mineral Society" or Email: omgms.57@gmail.com; Phone 417-882-8449; contact Larry Lillich, PO Box 35, 2131 W Republic Road, Springfield, MO 65807, (417) 882-8449; e-mail: omgms.57@gmail.com

6-7—MC CALLA, ALABAMA:

Annual show; Alabama Mineral & Lapidary Society, Tannehill Historical Ironworks State Park; 12632 Confederate Parkway, 35111; Sat. 9 a.m.-5 p.m., Sun. 9 a.m.-5 p.m.; Adults \$4.00,

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Seniors 62 yrs. ^ \$3.00, Students 6 to 12 yrs. \$2.00, Children 5 and under FREE; Admission to the show is free with paid admission to the park.; contact Cathy Kellogg; e-mail: tannehillgemshow@gmail.com; Web site: lapidaryclub.com

6-7—MANSFIELD, OHIO: Annual show; Richland Lithic & Lapidary Society, Richland County Fairgrounds; Arts and Crafts Building, 750 N. Home Road; Sat. 10:00 am-6:00 pm; Adults \$5.00, Seniors \$4.00, Students \$3.00, Children under 6 Free; The Richland Lithic and Lapidary Society presents their annual gem, mineral, jewelry and fossil show June 6-7, 2015. The theme for the show will be Prehistoric Monsters of the Deep. There will be museum fossil specimens from The Ohio State University. There will be other fossils from private collectors on display. The show will be held at the Arts and Crafts Building at the Richland County Fairgrounds, 750 N. Home Rd., Mansfield, Ohio. Show hours will be Sat. 10-6 and Sun. 11-5. Admission for the show will be Adults \$5.00, Seniors \$4.00, and children (6-16) \$3.00. Scouts in uniform and children under 6 free. There will be 12 quality dealers selling gems, minerals, jewelry, fossils and other hobby related objects. There will be Speakers, Geode Breaking, Demonstrations, and Hourly Door Prizes. A Silent Auction will run hourly both days.; contact Tom Kottyan, (419) 562-1152; e-mail: the-mineralhouse@netzero.net; Web site: WWW.RLLS.WEBS.COM

6-7—VIROQUA, WISCONSIN: Annual show; Coulee Rock Club, Junior High School Gymnasium; 100 Blackhawk Drive; Sat. 10 am-5 pm, Sun. 10 am-4 pm; Admission is Free!; Annual show. Mineral and fossil specimens, lapidary equipment and supplies, crystals and handcrafted jewelry. Silent auctions of materials donated by dealers and members will be held hourly.; contact Alison Alison, Viroqua, WI, (507) 895-8109; e-mail: rockinbabe@acegroup.co

6-7—MARION, KENTUCKY: Annual show; Ben E. Clement Mineral Museum, Fohs Hall; 201 North Walker Street; Sat. 9:00 am-5:00 pm, Sun. 9:00 am-4:00 pm; Admission is Free; Vendor tables, Bake Sale, Free Children's Activities, Silent Auctions, Hourly Door Prizes, Indian Artifact Display, Day and Night Digs*, Beading Class at 2PM on Saturday*, Museum Tours*. There is a charge for the items marked with an asterick.; contact Tina Walker, P.O. Box 391, Marion, KY 42064, (270) 965-4263; e-mail: beclement@att.net; Web site: www.clement-mineralmuseum.org

6-7—MONROE, NEW YORK: Show and sale; Orange County Mineral Society, Museum Village; 1010 Rt. 17M; Sat. 10:00 am-4:00 pm, Sun. 10:00 am-4:00 pm; Adults \$5.00, Seniors \$3.00, Students \$3.00, Children under 6 Free; On Display The most com-

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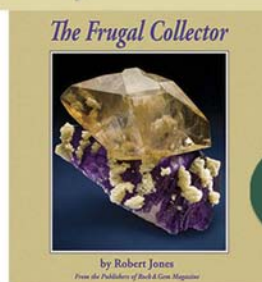
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plete Mastodon found in NY State Extensive Local Mineral Collection New Fluorescent Mineral Display Local and National Dealers Offering Minerals, Jewelry, Gems, Fossils for sale; contact George Gardianos, 5 Quaker Ridge Rd, Westtown, NY 10998, (845) 683-1167; e-mail: gggard@optonline.net; Web site: OrangecountymineralsocietyNewYork

6-7—CANANDAIGUA, NEW YORK:

Annual show; Wayne County Gem and Mineral Club, Greater Canandaigua Civic Center; 250 N. Bloomfield Road; Sat. 10:00 am-5:00 pm, Sun. 10:00 am-4:00 pm; Adults \$3.00, Children Under 12 Free; vendors, exhibits, crafts, kid's activities, and more. ; contact Fred Haynes, 10 Country Club Drvie, Rochester, NY 14618, (585) 203-1733; e-mail: fredmhaynes55@gmail.com; Web site: www.wcgmc.org

7-7—DALLAS, TEXAS:

Auction; Heritage Auctions, Heritage Auctions - Design District Annex; 1518 Slocum Street; Sun. 10:00 am-10:00 pm; Admission is Free!; Location: Dallas, TX Bidding Begins: Approx. May 1, 2015 Auction Dates: June 7th Lot Viewing: HIGHLIGHTS ONLY April 30 - May 4, 2015 Ukrainian Institute of American at The Fletcher-Sinclair Mansion 2 East 79th Street New York, NY 10075 FULL PREVIEW June 4-7, 2015 Heritage Auctions - Design District Annex 1518 Slocum Street Dallas, TX 75207 RECEPTION PREVIEW Friday, June 5, 2015 Heritage Auctions - Design District Annex 1518 Slocum Street Dallas, TX 75207; contact Heritage Auctions, (866) 835-3243; e-mail: bid@ha.com; Web site: http://fineart.ha.com/c/auction-home.zx?saleNo=6150

12-14—LODI, CALIFORNIA:

Annual show; California Federation of Mineralogical Societies Show, Lodi Grape Festival & Harvest Fair; 413 East Lockeford St.; Fri. 10 am-5 pm, Sat. 10 am-5 pm, Sun. 10 am-4 pm; Adults \$6.00, Children under 12 Free with adult; We will have Dealers with rough & polished Rocks, Gems, Minerals, Fossils, Beads, Craft Tools, Lapidary Equipment, Fine Jewelry, & more. Showcases, & Competitions Cases, Silent Auction, Raffles, Door Prizes, 5 Different Speakers, Kids Educational Activities, Lapidary Demonstrations, & Snack Bar. On Display will be the Golden Bear, Benitoite, Meteorite from Sutter Mill, the Raw Silver Collection and the Sabor Tooth Tiger Smilodon. Submitted by Vivien Roberts E-Mail mvroberts1@comcast.net; contact Margaret Kolaczyk, CA, (209) 296-5597; e-mail: markolaczyk@gmail.com; Web site: www.cfmsinc.org

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O IN THE ROCKS

Winter Wonderlands

The internationally known Tucson rock, mineral and fossil event started at the end of January for me. On Jan. 25, I drove to Tucson to enjoy celebrating the 90th birthday of my longtime friend Ed David. I had come to know Ed back in the 1980s, when he would come from New Jersey to Tucson for the show. The birthday dinner was quite delightful and enjoyable. Ed has always been a very astute collector and, sharp as ever, he still collects fine minerals.

It so happened I knew that Ed lived next door to Malcolm Forbes in New Jersey. Malcolm was noted for owning some of Peter Carl Fabergé's famous Easter eggs that had been designed and made for the czars of Russia. They were on exhibit in the Forbes Museum in New York City. In 1999, I spoke to Ed about getting a Fabergé egg for a future Tucson Gem and Mineral Show®, organized by the Tucson Gem & Mineral Society (TGMS). Ed agreed to approach the Forbes Museum people. The result was that we were able to obtain a remarkable special display featuring Fabergé eggs and jewelry for the 2001 TGMS Show.

My next move was to attend the Quartzsite Improvement Association (QIA) Pow Wow in Quartzsite, Arizona. This amazing desert event dates back to 1965, when it was started as a way to raise money for two



The display by TU Bergakademie Freiberg, in Germany, featured fine, classic German minerals.

amenities deemed essential to the tiny, isolated community in a desolate part of the Sonoran Desert: a fire engine and a small medical facility. When Interstate 10 was built right through the town, the emergency services became even more important in case of traffic accidents.

One notable event in Quartzsite's quirky history was when the Army brought camels to this area in the late 1800s in hopes of establishing a caravan service to the Arizona interior, where rich mines were operating. Steamboats would work their way up the nearby Colorado River to a point near what was then Fort Tyson and unload their cargo. The plan was to haul the supplies by camel overland to the mines. The caravan experiment ended up a failure and the camels were released into Arizona's desert, where they fended for themselves. The last recorded sighting of a camel in Arizona was in the 1920s.

The fort was a watering hole on the route to the California gold fields and a crossroads on the various routes through the Desert Southwest in the 1800s. Quartzsite, established on the site in 1865, saw a steady stream of prospectors and pioneers. In more recent decades, it became a quiet desert camp where northern visitors, known as "snowbirds", would park their camp-

ers and RVs for the winter to avoid the cold. During these months, the population swells from about 6,000 to over 250,000.

The QIA decided to hold a mineral show because mineral collecting was one of the more popular desert activities around Quartzsite in the winter. Little did they realize that fundraising effort would develop into the largest desert event in America. What I would call the largest desert tailgate and swap meet show in the world now encircles Quartzsite in the winter months. When the QIA Show ends in late January, many dealers pack up and head for Tucson.

The TGMS Show is the focal point of the amazing Tucson event, which involves 40 or more shows during the months of January and February. This four-day show opens the second Thursday in February. It is preceded by more than three dozen other shows. Many of these are wholesale shows that are closed to the general public.

The TGMS Show is often referred to as "The Main Show", and for good reason. It features more than two dozen exhibits from museums all over the world, and well as displays of specimens from the finest private collections, and the most important mineral and jewelry dealers to be seen in Tucson. Excellent lecturers educate the public about the science of minerals. In addition, several organizations hold their annual meetings in conjunction with the TGMS Show.



The Rice Museum has many classic minerals, including this amazing, large phosgenite from Sardinia.

Most important, the TGMS selects a theme for its show each year. This determines to a considerable extent what museums and private collectors decide what to exhibit at the Show.

The theme chosen for the 2015 TGMS Show was "The Minerals of Western Europe". This was a very astutely chosen theme as Europe is the birthplace of modern mining and the sciences of crystallography and mineralogy. The mines of Western Europe have produced many of the finest examples of dozens of species ranging from rare to species that are extremely popular among collectors.

There were a couple of surprises for me in Tucson. Copies of Issue #9 of "Minerals: The Collector's Newspaper" were available for free. This is an annual offering by the not-for-profit group Spirifer Minerals (www.spiriferminerals.com) in Europe, headed by Editor Tomasz Praszczkier and Associate Editors Paul Cragan and Malcolm Southwood. The surprise for me was the seven-page "Collector's Interview" that featured my son Evan Jones and me. We had worked with Tom on this for several months and the results are really impressive; the article features many minerals from Evan's collection.

The second surprise came when I attended the Ed's birthday party. Mutual friend Gene Meieran, a retired official of Intel, spoke to me about Yale University's plan to establish a new mineral museum on its campus. This was very exciting news to me, as it was the Yale mineral collection that started me on my mineral career.

In 1936, I visited the Peabody Museum of Natural History, which housed the mineral collection, on a school field trip at age 10. It was the first time I had ever seen a mineral collection and it was exciting to say the least. I still remember many of the specimens I saw that day. The fluorescent mineral display especially caught my fancy.

Seeing that huge collection in a vast hall devoted to minerals was life-changing for me. Imagine my reaction when Gene asked my permission to submit my name to Yale as a candidate for the Board of Directors of the new museum. Needless to say, it took me one nanosecond to respond. The next step is to go to Yale in late April and get involved in the museum plans. Stay tuned!

While in Munich, I bought the book *Genesis and Classification of Agates and Jaspers: A New Theory*, written by Marco Campos Venuti. I started reading it, but got bogged down, as it is quite technical, so I set it aside. Luckily, the evening I gave a talk at the very fine Pueblo Show in Tucson, Marco himself gave a lecture on this new theory. Now I can read the book with some understanding. I find the theory fascinating, and once I absorb it I'll be writing about it in *Rock & Gem*. It is quite revolutionary and fascinating.

The exhibits of minerals from Western Europe at the TGMS Show were thrilling. Almost every important species source was represented. My favorite was a very lovely, vi-



A group of Arizona collectors assembled this fine display of Arizona minerals from private collections.

olet, type-locality erythrite in an exhibit from the new TU Bergakademie Freiberg (Freiberg University of Mining and Technology), in Freiberg, Germany. I was pleased to meet with and interview Dr. Erika Kruger who, along with her husband, was the prime force behind the development of this amazing new museum. The show display held a fine group of classic minerals.

Another exhibit that really excited me was the small but choice exhibit of classic minerals from the Rice Northwest Rock and Mineral Museum. The Rice Museum, located in Hillsboro, Oregon, is one of my favorites, as I had gotten to know Richard and Helen Rice back in the 1960s.

The Rice exhibit held an amazing phosgenite from Montiponi, Iglesias District, Sardinia. The specimen is one of the world's largest-standing (nearly 15 cm high), water clear and perfectly terminated. The centerpiece of that display was a huge, bright-green pyromorphite specimen from the classic locality Les Farges, Correze Department, France.

One of the more interesting exhibits was a host of superb tourmaline specimens from a private collection assembled by Gerhard Wagner. A lot of collectors specialize in one species, but few can afford to specialize in gem tourmaline crystal specimens from all over the world.

The collection on display held a variety of superb specimens from the now-famous Pederneira mine in Minas Gerais, Brazil. This mine has produced some of the most amazing multicolor, slender elbaïtes ever found. Some crystals exceed 15 cm and occur in diverging clusters of amazing beauty. The collection on display represented about a dozen localities—just a sampling of the total collection of several hundred tourmalines.

Yet another display I was most interested in seeing was assembled by a group of Arizona collectors under the odd name "Minions". Each member contributes specimens, and a committee, which includes my son Evan, assembles a superb exhibit of Arizona minerals each year. Their exhibits have been very well received by visitors. The Mineralogical Asso-

ciation Of Dallas (MAD) does the same thing, and their exhibit is always breathtaking.

A small exhibit I really was pleased to see was put in by Stefan Nicolescu, curator of the Yale University collection. Stefan assembled a display saluting one of Yale's great mineralogists, James Dwight Dana (1837-92). It was James who, along with Edward Salisbury Dana, published the Dana series of mineralogy texts that is still a functional reference today. James and Edward were practicing mineralogists on the forefront of establishing the chemical indexing of minerals. Before their time, the language and literature of mineralogy was inaccurate. For example, the mineral quartz was called "sliex" at the time. I doubt any serious mineral collector has a library lacking the Dana series; it is that important. Yale was, at that time, the leading mineralogy institution, and it is my hope is that we will see a renaissance in mineralogy at that university in the future.

As usual, I helped Dave Wilber host "What's Hot in Tucson", a DVD put out by BlueCap Productions each year. It takes time to edit the footage, but later this year you can obtain a copy at <http://shop.bluecapproductions.com/>. The 2014 "What's Hot in Tucson" is still available, and I did most of the hosting on that one.

You can also see the entire Wagner tourmaline collection in the book *The World of Tourmaline: The Gerhard Wagner Collection* from the Bluecap Productions store. And if you prefer to see the tourmalines on your computer, go to the Nature and Science section of the Heritage Auctions Web site, www.ha.com. The Dallas firm will auction the Wagner tourmaline collection on June 7. 💎

Bob Jones holds the Carnegie Mineralogical Award, is a member of the Rockhound Hall of Fame, and has been writing for *Rock & Gem* since its inception. He lectures about minerals, and has written several books and video scripts.





Red Quartz Carved Crystal Skull Sculpture

This fine art carving was carved from a specimen from Brazil. It measures 6.4 x 4.6 x 6.2 inches. It is designed by Steven Z of Skullis.com, who, together with Barry Liu, designed and created the majority of the sculptures featured in the A Crystal Skull a Day event, which began June 1, 2014.

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